ALTADENA LIBRARY DISTRICT

REQUEST FOR PROPOSALS

PROPOSAL AND CONTRACT DOCUMENTS

FOR

ALTADENA MAIN LIBRARY

RENOVATION PROJECT

- Proposals will be received by Nikki Winslow, electronically on https://www.bidnetdirect.com/california/ald **until 3:00 pm on October 1, 2025**.

Table of Contents

Part 1: Proposal Requirements

Part 2: Contract Documents

Part 3: General Conditions

Part 4: Geotechnical Update Report

Part 5: Underground Utility Survey

Part 6: Hazardous Materials Survey Report, Roof Deck Asbestos Survey

Part 7: Asbestos and Lead Abatement Specifications

Part 8: Project Manual

Part 9: Construction Drawings

PART 1: PROPOSAL REQUIREMENTS

REQUEST FOR PROPOSALS

Proposals will be received at the Altadena Library District, 600 E. Mariposa Street, Altadena, CA 91001 or electronically at https://www.bidnetdirect.com/california/ald until 3:00 pm on October 1, 2025, at which time proposals will be opened for the:

ALTADENA MAIN LIBRARY

RENOVATION PROJECT

The proposed work consists of renovation and additions to the Altadena Main Library at **600 E. MARIPOSA STREET, ALTADENA, CA 91001.** Work includes but is not limited to construction of certain improvements to the existing Library as set forth in the Plans and Specifications for the Project.

Completion of Work: All work shall be completed within:

- Building Renovation and Improvements, 487 Calendar Days from Notice to Proceed. **NOTE: Before actual construction may commence a Conditional Use Permit (CUP) must be issued by Los Angeles County. The Library anticipates issuance of the CUP by January 20, 2026. In the event issuance is delayed beyond that date, the Completion Date will be extended on a day-for-day basis until the CUP is issued.** Prior to issuance of the CUP the selected contractor will be expected to perform pre-construction tasks following issuance of the Notice to Proceed.

Anticipated Solicitation Timeline (subject to change):

August 18, 2025 – RFP Issued

August 27, 2025 – Job Walk

September 17, 2025 – Questions Due

October 1, 2025 – Proposals Due

October 27, 2025 – Board of Trustees Award of Contract

November 10, 2025 – Notice to Proceed, Begin Preconstruction Activities

January 21, 2025 – Begin Site Construction Activities

Obtaining Contract Documents: Contract Documents, including Plans and Specifications for the Project, may be obtained online at https://www.bidnetdirect.com/california/ald.

Questions: Project-specific questions must be made in writing and sent to the District's Capital Projects Manager, Jennifer Pearson, at jennifer.pearson@huckabee-inc.com. If appropriate, the District will post responses to proposer questions received at https://www.bidnetdirect.com/california/ald. The cutoff date for submittal of questions is **5:00 pm on September 17, 2025,** local time.

Job Walk: There will be a job walk on **September 4, 2025 at 11:00 am local time**, at **600 E. MARIPOSA STREET, ALTADENA, CA 91001**. Attendance at the job walk is mandatory.

Submission of Proposals: All proposals must be submitted not later than the date and time prescribed. The proposer is wholly responsible to ensure its proposal is submitted on the date and at the time and place designated for the opening of proposals. Any proposal received after the time and date specified shall not be considered. Any proposal may be withdrawn prior to the scheduled time for opening proposal. Each proposal must conform and be responsive to this notice and shall be made on the official proposal forms furnished with the Contract Documents.

Contractor's License: Proposers must possess a current Class B General Contracting license issued by the State of California, in addition to such other licenses as may be necessary to perform any and all contract work, at the time the proposal is submitted.

Contractor Registration: All Proposers and listed subcontractors must have registered with the California State Department of Industrial Relations pursuant to Labor Code section 1725.5 prior to submitting a proposals. Furthermore, a Contractor and all subcontractors must be registered pursuant to Labor Code section 1725.5 before entering into a contract to work on a public project.

Award: The award shall be made to the most qualified proposer in the best interests of the District, in the sole discretion of the District. The lowest cost proposal shall not necessarily be the most qualified proposal selected. Pursuant to District Purchasing Policy Section 6-1, the District will strive to purchase from the lowest responsible proposer. However, cost shall not be the sole factor in selecting vendors to provide products and services necessary for operations. Value, future costs, and quality of service shall be given equal weight. The award of the Contract will be made by the Altadena Library District Board of Trustees in a noticed meeting, and the Contractor shall execute the Contract within ten (10) days after it has received the signed Contract from the District following award. **A notice of intent to award the Contract is not the formation of a contract, and is not binding on the District in any manner unless and until the Contract is formally awarded by the Board as set forth above.**

Rejection of Proposals: The District reserves the right to reject any and all proposals, or to waive immaterial irregularities in any proposal. Any proposal not conforming to the intent and purpose of the Contract Documents may be rejected. The District reserves the right to make all awards in the best interest of the District. Should all proposals be rejected, the District may re-advertise and seek proposals at a later date, in its sole discretion.

Disqualification of Proposer: If there is a reason to believe that collusion exists among any Proposers, none of the proposals of the participants in such collusion will be considered and the District may likewise elect to reject all proposals received.

Wage Rates: Proposers are hereby notified that the California Department of Industrial Relations has determined the general prevailing rate of wages for each craft, classification, or type of worker needed to execute the work. Copies of the current schedules for prevailing wages applicable to this project are on file in the District's office. It shall be mandatory for the Contractor and any subcontractor under it to pay not less than the said specified rates to laborers and workmen employed by them in the execution of the Contract.

Bonds: The successful Proposer will be required to furnish a payment bond in an amount equal to one hundred percent (100%) of the Contract price, and a faithful performance bond in an amount equal to one hundred percent (100%) of the Contract price.

INSTRUCTIONS TO PROPOSERS

Each Proposal shall be in accordance with the Contract Documents.

1. **Plans**

Additional copies of full scale plans may be obtained as specified in the Request for Proposals

2. **Local Conditions**

(a) The Proposer shall examine carefully the site of the work contemplated and the Contract Documents. The submission of a proposal shall be conclusive evidence that the Proposer has investigated and is satisfied as to the conditions to be encountered, as to the character, quality and quantities of work to be performed and the materials to be furnished, and as to the requirements of the Contract Documents.

(b) Where the Architect and/or Engineer has made investigations of surface and subsurface conditions in areas where work is to be performed under the Contract, or in other areas, some of which may constitute possible local material sources, such investigations were made only for the purpose of study and design. Where such investigations have been made, Proposers and/or the selected Contractor may, upon written request, inspect the records of the Architect/Engineer as to such investigations subject to and upon the conditions hereinafter set forth. Such inspection of records may be made at the office of the Architect/Engineer.

(c) The records of such investigations are not a part of the Contract and are made available for inspection solely for the convenience of the Proposer or selected Contractor. It is expressly understood and agreed by Proposer or the selected Contractor that neither the District nor the Architect or Engineer assumes any responsibility whatsoever with respect to the sufficiency or accuracy of the investigations thus made, the records thereof, or of the interpretation set forth therein or made by the Architect or Engineer in their use thereof, and there is no representation, warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are correct or representative of those existing throughout such areas or any part thereof, or that unanticipated developments may not occur or that materials other than, or in proportions different from, those indicated may not be encountered.

(d) The availability or use of information described in this section or the special conditions is not to be construed in any way as a waiver of the provisions of this section and a Proposer or selected Contractor is cautioned to make such an investigation and examination as it deems necessary to satisfy itself as to conditions to be encountered in the performance of the work and, with respect to possible local material sources, the quality and quantity of material available from such property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the Specifications.

(e) No information derived from such inspection of records of investigations or compilations thereof made by the Architect, the Engineer or the Engineer's assistants, will in any way relieve the Proposer or Contractor from any risk or from properly fulfilling the terms of the Contract.

(f) Information derived from inspection of topographic maps, or from Plans showing location of utilities and structures will not in any way relieve the Contractor from any risk, or from

properly examining the site and making such additional investigations as it may elect, or from properly fulfilling all the terms of the Contract.

(g) Each Proposer shall inform itself of, and the Proposer awarded a Contract shall comply with, federal, state and local laws, statutes, and ordinances relative to the execution of the work. This requirement includes, but is not limited to, applicable regulations concerning employment of labor, protection of public and employee safety and health, protection, the protection of natural resources, fire protection, burning and non-burning requirements, permits, fees, and similar subjects.

3. **Form of Proposal and Signature**

(a) Proposals shall be submitted only on the forms attached hereto and shall be enclosed in a sealed envelope and marked and addressed as hereinafter directed. The Proposer shall state in figures the unit prices or the specific sums as the case may be, for which it proposes to supply the labor, materials, supplies or machinery, and perform the work required by the Specifications. Proposal prices will be deemed to include all applicable fees and taxes including sales tax. If the Proposal is made by an individual, it shall be signed by the individual and the individual's full name and address shall be given; if it is made by a partnership, it shall be signed with the co-partnership name by a member of the partnership, who shall also sign the member's own name, and the name and address of each member of such partnership shall be given; and, if it is made by a corporation, the name of the corporation shall be given and it shall be signed by its duly authorized officer or officers attested by the corporate seal, the name and titles of all officers of the corporation shall be given, and the address of the corporation and the state in which incorporated shall be stated.

(b) In addition to completing the forms attached hereto, the following information shall be provided in a separate proposal document submitted by each Proposer:

1. Firm Information

   (a) Proposer information, including history/structure;

   (b) All Licenses possessed by Proposer;

   (c) Proposer DIR registration;

   (d) Information regarding financial resources available for performance of the Contract Work;

   (e) Any past or existing claims against the Proposer, including any terminations/failures to complete prior or current contracts;

   (f) Proposer safety record (EMR, OSHA compliance, etc.);

   (g) Proposer bonding capacity;

2. Experience

(a) Proposer Experience with public works projects, including with LA County, SCAQMD, etc.;

(b) Recent similar project information with the following data:

(i) Project description, including project location, type, size and relevant features

(ii) Project Delivery Method

(iii) Initial contract amount and final cost

(iv) Construction start and completion dates

(v) Owner contact information;

3. Project Approach

(a) Proposed Project personnel;

(b) Proposed Project schedule with milestones;

(c) Firm's approach to cost, schedule, and risk management;

4. Proposer References;

5. Any Proposer comments to the form of contract for this Project.

(c) Proposals will be considered only from persons or entities licensed as required under applicable provisions of the Contractor's License Law (Cal. Bus. and Prof. Code section 7000, et seq.) and rules and regulations adopted pursuant thereto; and each Proposer shall insert its type of contractor's license, license number, and other requested information in the place provided in the Proposal. No oral, telephonic or facsimile Proposal or modification of a Proposal will be considered.

(d) If hard copy proposals are submitted, the District will need 5 copies for review, or an electronic copy on USB drive that can be distributed to the review panel. Electronic submittal is preferred.

4. **Submittal of Proposals**

(a) All Proposals must be submitted not later than the time prescribed, at the place and in the manner set forth in the Request for Proposals. Proposals must be made on the prescribed Proposal Forms. A complete Proposal requires submission of all documents identified in subsection (d) below. The Proposer is wholly responsible to see that its Proposal is submitted at the time and place named for the opening of Proposals.

(b) Proposals shall include all addenda or clarifications issued during the Proposal period acknowledged by the Proposer's signature thereon. Failure to so include or acknowledge an addendum or clarification may result in the Proposal being rejected as not responsive.

(c) Proposal documents to be submitted shall include the following:

(1) Completed Proposal

(2) Proposal Signature Sheet

(3) Non-Collusion Declaration

(4) Completed Subcontractor List

(5) Proposer's Checklist

(6) Proposal Documents required by section 3(b).

5. **Preparation of Proposal**

Blank spaces in the Proposal shall be properly completed. The phraseology of the Proposal must not be changed and no additions shall be made to the items mentioned therein. **Unauthorized conditions, limitations or provisions attached to a Proposal may cause its rejection. Similarly, Proposers are expected to carefully review the Contract terms and documents included herewith, as any requested changes to the Contract terms or documents may, in the sole discretion of the District, be further grounds for rejection of a Proposal.** If erasures, interlineations or other changes appear on the form, each erasure, interlineation or change must be initialed by the person signing the Proposal. Alternative Proposals will not be considered unless specifically provided for in the Proposal Schedule. No Proposal received after the time fixed, or received at any place other than the place stated in the Request for Proposals will be considered. Proposers, their representatives and other interested parties are invited to be present at the opening. Where bonds are required, the Proposer shall name in its Proposal the surety or sureties who have agreed to furnish said bonds.

6. **List of Subcontractors**

(a) Each Proposer shall set forth in its Proposal on the form provided the following information in accordance with the provisions of Public Contract Code sections 4100-4113:

(1) The name, contractor's license number, and the location of the place of business of each Subcontractor who will perform work or labor or render service to the prime Contractor in or about the construction of the work or improvement, or a Subcontractor licensed by the State of California who, under subcontract to the prime Contractor, specifically fabricates and installs a portion of the work or improvement according to the Contract Documents, in any amount in excess of one-half of one percent (0.5%) of the prime Contractor's total Proposal, or ten thousand dollars ($10,000), whichever is greater.

(2) The portion of the work which will be done by each such Subcontractor. Only one Subcontractor shall be listed for each such portion of the work as defined in the Proposal.

(b) If the Proposer fails to specify a Subcontractor for any portion of the work to be performed under the Contract, the Proposer agrees to perform that portion of the work itself.

7. **Interpretation of Contract Documents**

Any explanation desired by the Proposers regarding the meaning or interpretation of any of the Contract Documents must be submitted in writing by **3:00 p.m. local time on September 17, 2025**. Requests for clarification received after the above noted deadline may be answered at the discretion of the Architect, Engineer or District Representative as the District deems appropriate. Any such explanations or interpretations will be made in the form of Addenda to the documents and will be furnished to all Proposers who shall submit all addenda with their Proposals. Neither the Architect nor any representative of the District is authorized to give oral explanations or interpretations of Contract Documents, and a submission of a Proposal constitutes agreement by the Proposer that it has placed no reliance on any such oral explanation or interpretation. However, the Architect may, upon inquiry by Proposer, orally direct the Proposer's attention to specific provisions of the Contract Documents which cover the subject of the inquiry.

Requests for Clarifications must be made in writing and sent to the District's Capital Projects Manager. If appropriate, the District will post responses to Proposer questions. The cutoff date for submittal of questions is **3:00 p.m. local time on September 17, 2025.**

8. **Modification of Proposals**

A Proposer may modify its Proposal by written communication provided such communication is received by the District prior to the closing time for receipt of Proposals. The written communication should not reveal the Proposal price but should state the addition or subtraction or other modification so that the final prices or terms will not be known by the District until the sealed Proposal is opened.

9. **Withdrawals of Proposals**

Proposals may be withdrawn without prejudice by written or facsimile requests received from Proposer prior to the time for opening of Proposals, and Proposals so withdrawn will be returned to Proposers unopened when reached in the process of opening Proposals.

10. **Discrepancies**

In the case of discrepancy between unit prices and totals, unit prices will prevail and the District will recalculate the Proposal total based on the unit prices and estimated quantities. In case of discrepancy between words and figures, words will prevail. Discrepancies between drawings and specifications, the more stringent will prevail.

11. **Equipment Types and Brands Disclosures**

Each Proposer must furnish evidence before acceptance of Proposal, names of brands of all major equipment included in the Proposal. These must be approved prior to awarding the contract.

12. **Disqualification of Proposers**

(c) More than one Proposal from an individual, firm, partnership or corporation under the same or different names will not be considered. Reasonable grounds for believing that any individual, firm, partnership or corporation is interested in more than one Proposal for the work contemplated may cause the rejection of all Proposals in which the individual, firm, partnership or corporation is interested. If there is reason for believing that collusion exists among the

Proposers, any or all Proposals may be rejected. Proposals in which the price is obviously unbalanced may be rejected.

13. **Opening & Award of Contract**

Proposals will be opened at the time and date established in the invitation to Proposers.

(a) The District reserves the right to reject any or all Proposals, including, without limitation, the right to reject any non-conforming, non-responsive, unbalanced, or conditional Proposals.

(b) Before a Proposal is considered for award, the District may, in addition to the forms and written proposals included in the Proposal documents, require a Proposer to submit a statement of facts and detail as to its business, technical organization and financial resources and equipment available and to be used in performing the work. Additionally, the District may require evidence that the Proposer has performed other work of comparable magnitude and type. The District expressly reserves the right to reject any Proposal if it determines that the business and technical organization, equipment, financial and other resources or other experience of the Proposer (including the Proposer's Subcontractors) is not sufficiently qualified for the work Proposal upon and, therefore, justifies such rejection. The District may further choose to interview a short list of potentially successful proposers if the District deems it to be necessary.

(c) Scoring Criteria - The District may utilize the following criteria, in addition to any other information the District deems material and relevant in determining which Proposer shall be awarded the Contract:

1. Proposed Price;
2. Firm information;
3. Prior relevant experience;
4. Project approach (schedule management, cost management, risk assessment);
5. Comments to contract;
6. Overall suitability for District project.

14. **Proposal Protests**

The lack of a prompt procedure to resolve disputes regarding the Proposal process would impair the District's ability to carry out its purpose of constructing this project in a timely manner. Therefore, to the maximum extent authorized by law and notwithstanding any other procedures specified in documents referenced herein, all disputes and/or protests regarding the Proposal process shall be subject to the following procedure. In submitting a Proposal to the District for this project, the Proposer agrees to comply with and to be bound by this procedure.

Any Proposal protest must be submitted in writing to Jennifer Pearson, Huckabee at 8640 National Boulevard, Culver City, CA 90232 before 5:00 p.m. on the fifth (5^{th}) working day following Proposal opening.

(a) The initial protest document must contain a complete statement of the basis for the protest, and all supporting documentation.

(1) The party filing the protest must have actually submitted a Proposal for the Work. A subcontractor of a party submitting a Proposal for the Work may not submit a Proposal protest. A party may not rely on the Proposal protest submitted by another Proposer, but must timely pursue its own protest. protest must refer to the specific portion of the Contract Documents which forms the basis for the protest.

(b) The protest must include the name, address and telephone number of the person representing the protesting party.

(c) The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such parties shall include all other Proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

(d) The District will give the protested Proposer five (5) working days after the receipt of the protest to submit a written response. The responding Proposer shall transmit the response to the protesting Proposer concurrent with delivery to the District.

(e) The procedure and time limits set forth in this paragraph are mandatory and are the Proposer's sole and exclusive remedy in the event of Proposal protest. The Proposer's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Proposal protest, including filing a Government Code Claim or legal proceedings. A Proposer may not rely on a protest submitted by another Proposer, but must timely pursue its own protest.

(f) If the District determines that a protest is frivolous, that Proposer may be determined to be ineligible for future contract awards.

15. **Contract Bonds**

(a) The successful Proposer shall furnish both a Performance Bond and a Payment Bond in the amount of one hundred percent (100%) of its Total Proposal Price.

(b) These Bonds shall be furnished in the forms enclosed following the Contract and shall be satisfactory to the District and shall be obtained from a responsible corporate surety (or sureties) acceptable to the District, which is admitted by the State of California to act as surety upon bonds and undertakings and which maintains in this State at least one office for the conduct of its business. The surety (or sureties) shall furnish reports as to its financial condition from time to time as requested by the District. The premiums for said Bonds shall be paid by the successful Proposer.

(c) These Bonds shall be furnished by companies who are authorized and licensed by the Insurance Commissioner as an “admitted surety insurer.” The surety shall provide the District with the documentation required by Section 995.660 of the California Code of Civil Procedure.

(d) If any surety becomes unacceptable to the District or fails to furnish reports as to its financial condition as requested by the District, the Contractor shall promptly furnish such

additional security as may be required from time to time to protect the interests of the District and of persons supplying labor or materials in the prosecution of the work contemplated by this Contract.

(e) In the event of any conflict between the terms of the Contract and the terms of the Bonds, the terms of the Contract shall control and the Bonds shall be deemed to be amended thereby. Without limiting the foregoing, the District shall be entitled to exercise all rights granted to it by the Contract in the event of default, without control thereof by the surety, provided that the District gives the surety notice of such default at the time or before the exercise of any such right by the District, and, regardless of the terms of said Bonds, the exercise of any such right by the District shall in no manner affect the liability of the surety under said Bonds.

16. Substitution of Securities for Monies Withheld

Proposers are hereby notified that in accordance with the provisions of Public Contract Code section 22300, securities may be substituted for any monies which the District may withhold pursuant to the terms of the Contract to insure performance.

17. Execution of Contract

The successful Proposer will be notified in writing by the District of the award of the Contract within sixty (60) days, or less, after opening of Proposals. Accompanying the District's Notice of Intent to Award will be the Contract, in triplicate, which the successful Proposer will eventually be required to execute and return, together with the Performance and Payment Bonds, and the required certificates and policies of insurance together with the required endorsements thereto for the Contractor and the workers compensation certificate to the District. Such documents will be returned within ten (10) days following formal award of the Contract by the District. Failure to do so shall be just cause for annulment of the award. The District will promptly determine whether such Contract, Bonds and insurance are as required by the Contract Documents, and upon such determination will forward a fully executed copy of the Contract and a Notice to Proceed with the work to the successful Proposer. Signature by both parties constitutes execution of the Contract.

18. Power of Attorney

The Attorney-in-Fact (resident agent) who executes the Performance Bond and Payment Bond on behalf of the surety company must attach a copy of its Power of Attorney as evidence of its authority. A notary shall acknowledge the power as of the date of the execution of the surety bond which it covers.

19. Time of Completion

The time of completion of the work to be performed under this Contract is the essence of the Contract. Delays and extensions of time may be allowed in accordance with the provisions of the General Conditions. The time allowed for the completion of the work is stated in the Contract.

20. Licensing and Registration Requirements for Contractors

All Proposers, including general contractors and specialty contractors, shall hold such licenses as may be required by the laws of the State of California for the performance of the work specified in the Contract Documents.

(e) All Proposers and listed subcontractors must have registered with the California State Department of Industrial Relations pursuant to Labor Code section 1725.5 prior to submitting a Proposal. Furthermore, all contractors and subcontractors must be registered pursuant to Labor Code section 1725.5 before entering into a contract to work on a public project.

21. **Prevailing Wages**

Copies of the current schedules for prevailing wages are on file in the District's office, and the contents of those schedules are included herein as if set forth in full. Copies of the prevailing rate of per diem wages may also be obtained from the Department of Industrial Relations, P.O. Box 420603, San Francisco, CA 94142-0603, Attn: Chief, Division of Labor Statistics and Research or online at: http://www.dir.ca.gov/oprl/DPreWageDetermination.htm

22. **Preconstruction Conference**

A preconstruction conference will be convened after the Contractor has delivered the necessary bonds, insurance certificates and signed agreement in proper form as required in the Request for Proposals and general conditions of these specifications. Prior to any work, the Contractor shall provide the District Representative/Architect/ Engineer with a list of key personnel assigned to the project and the telephone numbers where they may be reached at any time. The list shall be made available in sufficient copies and presented at the preconstruction conference.

PROPOSER'S CHECKLIST

All items on the Proposer's Checklist must be initialed, dated and submitted for the Proposal to be considered complete. The District reserves the right to award a Contract in a manner and on the basis which will best serve the District, taking into consideration the information in the statement of Proposer's Proposal, qualifications and past work history with the District and in the local area. The Proposer's attention is especially called to the following forms which must be executed in full as required:

1. a) **PROPOSAL**
   The total Proposal price must be shown in the space provided.

   Initial: _____ Date: _____

   b) **PROPOSAL SIGNATURE SHEET**
   To be filled in and signed by the Proposer.

   Initial: _____ Date: _____

3. **NON-COLLUSION DECLARATION**
   A Non-Collusion Declaration must be filled out, signed, and submitted with the Proposal for the Proposal documents to be considered complete.

   Initial: _____ Date: _____

4. **DESIGNATION OF SUBCONTRACTORS**
   A Designation of Subcontractors must be filled out and submitted with the Proposal for the Proposal documents to be considered complete.

   Initial: _____ Date: _____

5. **INSURANCE**
   The insurance requirements for this project have been read and understood.

   Initial: _____ Date: _____

6. **SITE VISIT (optional)**
   The Proposer certifies that it has toured the project site and is familiar with the work involved.

   Initial: _____ Date: _____

PROPOSERS CHECKLIST CONTINUED

7. **PERFORMANCE AND PAYMENT BONDS**
   The Proposer understands that a performance bond issued by an approved surety equaling one hundred percent (100%) of the Contract amount will be required. A payment bond equaling one hundred percent (100%) of the Contract amount will also be required.

Initial: _____ Date: _____

8. **WORK SCHEDULE**

The District makes no guarantee as to the method of work chosen by the Proposer. It is the Proposer's responsibility to plan and schedule the work in order to complete the work in the time specified in the Special Provisions.

Initial: _____ Date: _____

9. **PROPOSAL INFORMATION REQUIRED BY SECTION 3(b)**

The Proposer acknowledges that it must draft and submit a separate document containing all of the information requested under Section 3 (b) of the RFP.

Initial: _____ Date: _____

10. ADDENDA

The Proposer acknowledges that it must sign and attach any applicable addenda to the Proposal.

Initial: _____ Date: _____

11. **WORKERS COMPENSATION**

The Proposer acknowledgment that Worker's Compensation Insurance will be required for this project.

Initial:_____ Date:_____

PROPOSAL

The undersigned Proposer hereby proposes to furnish and deliver all necessary labor, tools, equipment, and other means of construction to perform the work required for the completion of the project entitled "**ALTADENA MAIN LIBRARY RENOVATION PROJECT"** in accordance with the intent of all plans, specifications, and addenda issued by the District in the amount of:

Base Bid:

(Written)_____ dollars

(Number) $_____.00

Additive/Deductive Alternates:
Descriptions of alternates are primarily scope definitions and do not necessarily detail the full range of materials and processes needed to complete the construction.

Alternate #1: North Patio and Sliding Doors.

(Written)_____ dollars

(Number) $_____.00

Alternate #2: Meeting Room Addition.

(Written)_____ dollars

(Number) $_____.00

Alternate #3: Children's Area Ceiling.

(Written)_____ dollars

(Number) $_____.00

Prior to the opening of the Proposal, the Proposer has read the accompanying instructions to Proposers, has carefully examined the location(s) of the proposed work, and has examined all Contract Documents, drawings and addenda issued by the District and will contract with the District to construct the project, complete and in satisfactory condition.

The Proposer further acknowledges that it has adjusted its Proposal price to include all possible items which may influence the proposal during the time period from notice of intent to award through and until formal award by the District. Requests for Proposal price change due to the delay shall not be agreed to by the District.

Company Name: _____

Proposer's Name (Printed): _____

Proposer's Title: _____

Proposer's Signature: _____

Date: _____

Address: _____

_____

Phone Number: _____

Contractor's License Number: _____

Classification: _____

Expiration Date: _____

NOTARIZED NON-COLLUSION DECLARATION

STATE OF CALIFORNIA)
)
COUNTY OF LOS ANGELES)

The undersigned declares:

I am the _____ of _____, the party making the foregoing Proposal.

The Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The Proposal is genuine and not collusive or sham. The Proposer has not directly or indirectly induced or solicited any other Proposer to put in a false or sham Proposal. The Proposer has not directly or indirectly colluded, conspired, connived, or agreed with any Proposer or anyone else to put in a sham Proposal, or to refrain from Proposing. The Proposer has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the Proposal price of the Proposer or any other Proposer, or to fix any overhead, profit, or cost element of the Proposal price, or of that of any other Proposer. All statements contained in the Proposal are true. The Proposer has not, directly or indirectly, submitted its Proposal price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, Proposal depository, or to any member or agent thereof, to effectuate a collusive or sham Proposal, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a Proposer that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that it has full power to execute, and does execute, this declaration on behalf of the Proposer.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____[date], at ___[District], ___[state].

Proposer's Name (Printed): _____

Proposer's Signature: _____
(Same Signature as on Proposal)

Proposer's Title:

_____

DESIGNATION OF SUBCONTRACTORS

Each Proposer shall submit the name, contractor license number, and business location of each subcontractor who will perform work or labor or render service to the Contractor for the construction of the work performed under these specifications in excess of one-half (1/2) of one percent (1%) of the prime Contractor's total Proposal. If the Contractor fails to specify a subcontractor for any portion of the work to be performed under the Contract, it shall be deemed to have agreed to perform such portion itself, and it shall not be permitted to subcontract that portion of the work except under the conditions hereinafter set forth. (Attach additional forms as necessary)

Name Subcontractor	Street Address of Shop, Mill or Office	Types of Work/Category of Contract	$ Value of Work to be Performed	DIR Registration Number	Subcontractor's License Number/ Type/Exp. Date

If no subcontractors will be used, write "None" here:_____

I declare under penalty of perjury that the foregoing is true and correct and this Declaration is executed this _____ day of _____, 20___, in _____, California.

By: _____

Contractor Company Name: _____

SUBCONTRACTOR FORM MUST BE RETURNED WITH PROPOSAL

PART 2: CONTRACT DOCUMENTS

CONSTRUCTION CONTRACT

THIS CONTRACT made on _____ by and between the Altadena Library District ("District"), and _____, hereinafter "Contractor". The District and Contractor may be collectively referred to as the "parties".

The parties have mutually covenanted and agreed as follows:

1. THE CONTRACT DOCUMENTS:

The complete Contract consists of the following documents ("Contract Documents"):

Request for Proposals
Addenda Nos. _____, as issued
Designation of Subcontractors
Construction Contract
Payment Bond to Accompany Contract
Performance Bond to Accompany Contract
General Conditions
Supplementary and Special Conditions (if any)
Architect's Plans
Architect's Plans and Specifications
Change Orders
Contractor's Certification Regarding Workers' Compensation

2. THE WORK:

The Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, transportation, and material necessary to perform and complete in a good and workmanlike manner, the **ALTADENA MAIN LIBRARY RENOVATION PROJECT** as called for, and in the manner designated in, and in strict conformity with, the Contract Documents. It is understood and agreed that the tools, equipment, apparatus, facilities, labor, transportation, and material shall be furnished and the work performed and completed as required in the Drawings and Specifications under the sole direction and control of the Contractor, and subject to inspection and approval of the District, or its representatives. The District hereby designates as its representative for the purpose of this Contract the following named person: _____.

3. CONTRACT PRICE:

The District agrees to pay and the Contractor agrees to accept, in full payment for the work above agreed to be done, the sum of [WRITTEN NUMBER] [(NUMBER)] for the Project subject to additions and deductions as provided in the Contract Documents.

4. COMPLETION DATE:

The Project shall be commenced on the date specified in the Notice to Proceed. The total project will be completed within [WRITTEN NUMBER] [(NUMBER)] working days, as defined in the General Conditions, after the date stated in the Notice to Proceed.

5. **NOTICE AND SERVICE THEREOF:**

Any notice from one party to the other under the Contract shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative of such party. Any such notice shall not be effective for any purpose whatsoever unless served in the following manner, namely:

(a) If the notice is given to the District, by personal delivery thereof or by depositing the same in the United States mail, enclosed in a sealed envelope, postage prepaid, and certified; addressed to the District at:

Altadena Library District
600 E. Mariposa Street
Altadena, California 91001
Attn: Nikki Winslow, Director

With a copy to:
Jeff Mitchell, Esq.
Kronick Moskovitz, Tiedemann & Girard
1331 Garden Highway, 2nd Floor
Sacramento, CA 95833

(b) If the notice is given to the Contractor, by personal delivery thereof to said Contractor or to its duly authorized representative at the site of the project, or by depositing the same in the United States mail, enclosed in a sealed envelope, postage prepaid, and certified; addressed to the Contractor at:

Business
Attention:
Street Address
District, State, Zip Code

(c) If the notice is given to the surety or any other person, by personal delivery to such surety or other person, or by depositing the same in the United States mail, enclosed in a sealed envelope, addressed to such surety or other person, as the case may be, at the address of such surety or person last communicated by it to the party giving the notice, postage prepaid and certified.

6. **LIQUIDATED DAMAGES:**

Liquidated damages as provided for in the General Conditions of the Contract shall be in the sum of One Thousand Dollars ($1,000.00) for each and every day as defined therein for each different scope of work as defined by the Base Proposal and each change order except as otherwise specified in the General Conditions.

7. **PREVAILING WAGE:**

Copies of the prevailing rate of per diem wages as determined by the Director of the Department of Industrial Relations in accordance with Labor Code section 1773 are on file at the District, and copies are available for inspection at that office to any interested party on request. Proposers shall be responsible for verifying with the Director of the Department of Industrial Relations that

all such copies of the prevailing rate provided by the District are current and accurate. The requirement to pay the wage rate so specified is further detailed in the General Conditions.

8. **CONTRACTOR REGISTRATION**

By the execution of this Contract, Contractor hereby certifies that it is registered with the California Department of Industrial Relations as required pursuant to Labor Code section 1725.5 (contractor registration).

IN WITNESS WHEREOF, four (4) identical counterparts of this Contract, each of which shall for all purposes be deemed an original, have been duly executed by the above-named parties, on the date noted on the first page of this Contract.

Date	Contractor
Date	For the Altadena Library District

Approved as to form:

Attorney for the Altadena Library District

PERFORMANCE BOND

The ALTADENA LIBRARY DISTRICT, hereinafter "District," entered into a Contract dated _____, 20___ with _____ hereinafter "Contractor," for the work described as follows: **ALTADENA MAIN LIBRARY RENOVATION PROJECT.** WHEREAS, said Contractor is required under terms of said Contract to furnish a bond for the faithful performance of said Contract; and WHEREAS, the Contract is by reference made a part hereof. NOW, THEREFORE, we, _____, the undersigned Contractor, as Principal, and _____ (corporate surety), a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the District in the penal sum of [WRITTEN NUMBER] [(NUMBER)], lawful money of the United States, said sum being not less than one hundred percent (100%) of the total Contract amount, for the payment of which sum be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.
THE CONDITION OF THIS OBLIGATION IS SUCH, THAT, if the above-bounded Contractor, its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and perform the covenants, conditions, and agreements in said Contract and any alterations thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the District, its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue.

As a condition precedent to the satisfactory completion of said Contract, the above obligation in said amount shall hold good for a period of one (1) year after the completion and acceptance of said work, during which time if the above-bounded Contractor, its heirs, executors, administrators, successors or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the District from loss or damage made evident during said period of one (1) year from the date of acceptance of said work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in said sum shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Contractor remains.

And the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall, in any way, affect its obligations on this bond and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California. In the event suit is brought upon this bond by the District and judgment is recovered, the Surety shall pay all costs incurred by the District in such suit, including reasonable attorneys' fees to be fixed by the Court.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20___.

_____
(Contractor as Principal)

(Seal) By _____

(Seal) By _____

NOTE: If Contractor is a Partnership, all parties must execute the Bond. IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in California.

PAYMENT BOND

The ALTADENA LIBRARY DISTRICT, hereinafter "District," has awarded to _____, hereinafter "Contractor," a Contract for the work described as follows: **ALTADENA MAIN LIBRARY RENOVATION PROJECT.** WHEREAS, the Contractor is required by the Contract and by the provisions of Third Division, Part 4, Title 15, Chapter 7 of the Civil Code to furnish a bond in connection with the Contract, as hereinafter set forth.

NOW, THEREFORE, we, _____, the undersigned Contractor, as Principal, and _____, a corporation organized and existing under the laws of the State of _ duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the _____ in the sum of [WRITTEN NUMBER] [(NUMBER)], said sum being not less than one hundred (100) percent of the total Contract amount payable by the District, under the terms of the Contract, for which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT, if the Contractor, its heirs, executors, administrators, successors, and assigns or subcontractors shall fail to pay for any materials, provisions, provender or other supplies or teams, implements or machinery used in, upon, for or about the performance of the work contracted to be done, or shall fail to pay for any work or labor thereon of any kind, or shall fail to pay any persons named in Civil Code section 9100, or shall fail to pay for amounts due under the Unemployment Insurance Code with respect to such work or labor thereon of any kind, or shall fail to pay for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Contractor and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code with respect to such work or labor, and provided that the claimant shall have complied with the provisions of that code, the Surety or Sureties hereon will pay for the same in an amount not exceeding the sum specified in the Contract; otherwise, the above obligation shall be void. In case suit is brought upon this bond, the Surety will pay reasonable attorneys' fees to the prevailing party to be fixed by the court.

This bond shall insure to the benefit of any and all persons, companies and corporations entitled to file claims under Section 9100 of the Civil Code, so as to give a right of action to them or to their assigns in any suit brought upon this bond.

It is further stipulated that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration, or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement described above or pertaining or relating to the furnishing of labor, materials, or equipment therefor, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement described above, nor by any rescission or attempted rescission of the Contract, agreement, or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond, and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the District and original contractor or on the party of the obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Sections 8400 and 8402 of the California Civil Code and has not been paid the full amount of its claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration, or modification.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20___.

_____
(Contractor as Principal)

(Seal) By _____

(Seal) By _____

NOTE: If Contractor is a Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in California.

CONTRACTOR'S CERTIFICATE REGARDING WORKER'S COMPENSATION

TO:

Altadena Library District

600 E. Mariposa Street

Altadena, California 91001

Attn: Nikki Winslow

I am aware of the provisions of Section 3700 of the Labor Code of the State of California which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

_____
(Contractor)

By _____

_____

_____
(Business Address)

_____

_____
(Place of Residence)

INSURANCE REQUIREMENTS FOR CONTRACTORS

Contractor shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, employees or subcontractors.

Minimum Scope of Insurance

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001).
2. Insurance Services Office form number CA 0001 (Ed. 1/87) covering Automobile Liability, code 1 (any auto).
3. Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

Minimum Limits of Insurance

Contractor shall maintain limits no less than:

1. General Liability: $2,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: $2,000,000 per accident for bodily injury and property damage.
3. Employer's Liability: $2,000,000 per accident for bodily injury or disease.
4. Excess Liability Insurance: to follow form of General Liability policy. $5,000,000 per occurrence for bodily injury, personal injury and property damage.

Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the District. At the option of the Entity, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the District, its officers, officials, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the District guaranteeing payment of losses and related investigations, claim administration and defense expenses.

Other Insurance Provisions

The automobile liability and general liability policies are to contain, or be endorsed to contain, the following provisions:

1. The District, its officers, officials, employees, and volunteers are to be covered as insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor; and with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts or equipment furnished in connection with such work or operations. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance, or as a separate owner's policy.
2. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the District, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the District, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
3. Each insurance policy required by the clause shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days prior to written notice by certified mail, return receipt requested, has been given to the District.

Acceptability for Insurers

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

Verification of Coverage

Contractor shall furnish the District with original certificates and amendatory endorsements effecting coverage required by this clause. The endorsements should be on forms provided by the District or on other than the District's forms, provided those forms or policies are approved by the District and amended to conform to the District's requirements. All certificates and endorsements are to be received and approved by the District before work commences. The District reserves the right to require complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications at any time.

Subcontractors

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

SUBMIT IN DUPLICATE

GENERAL LIABILITY SPECIAL ENDORSEMENT

FOR ALTADENA LIBRARY DISTRICT (the "District")

ENDORSEMENT NO:	ISSUE DATE:

PRODUCER

Telephone

POLICY INFORMATION:
Insurance Company:
Policy No.:
Policy Period : (from) (to)

LOSS ADJUSTMENT EXPENSE ☐ Included in Limits
☐ In Addition to Limits

☐ Deductible ☐ Self-Insured Retention (check which) of $_____
with an Aggregate of $ _____ applies to _____
coverage. ☐ Per Occurrence ☐ Per Claim

NAMED INSURED

APPLICABILITY. This insurance pertains to the operations and/or tenancy of the named insured under all written agreements and permits in force with the District unless checked here ☐ in which case only the following specific agreements and permits with the District are covered:
DISTRICT AGREEMENTS/PERMITS:

TYPE OF INSURANCE

☐ COMMERCIAL GENERAL LIABILITY ☐ Claims Made
☐ COMPREHENSIVE GENERAL LIABILITY Retroactive Date _____
☐ OWNERS & CONTRACTORS PROTECTIVE ☐ Occurrence

OTHER PROVISIONS

COVERAGES	LIABILITY LIMIT IN THOUSANDS EACH OCCURRENCE	AGGREGATE
☐ GENERAL		
☐ PRODUCTS COMPLETED OPERATIONS		
☐ PERSONAL & ADVERTISING INJURY		
☐ FIRE DAMAGE		

CLAIMS: Underwriter's representative for claims pursuant to this insurance

Name:_____

Address_____

_____

Telephone (_____)_____

In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:

1. INSURED. The District, Its elected or appointed officers, agents, volunteers and employees are included as additional insured with regard to liability and defense of suits arising from the operations, products and activities performed by or on behalf of the named insured.
2. CONTRIBUTION NOT REQUIRED. As respects: (a) work performed by the Named Insured for or on behalf of the District; or (b) products sold by the Named Insured to the District; or (c) premises leased by the Named Insured from the District, the insurance afforded by this policy shall be primary insurance as respects the District, its elected or appointed officers, officials, employees or volunteers; or stand in an unbroken chain of coverage excess of the Named Insured's scheduled underlying primary coverage. In either event, any other insurance maintained by the District, its elected or appointed officers, officials, employees or volunteers shall be in excess of this insurance and shall not contribute with it.
3. SEVERABILITY OF INTEREST. This insurance applies separately to each insured against whom claim is made or suit is brought except with respect to the company's limits of liability. The inclusion of any person or organization as an insured shall not affect any right which such person or organization would have as a claimant if not so included.
4. CANCELLATION NOTICE. With respect to the interests of the District, this insurance shall not be canceled, or materially reduced in coverage or limits excepts after thirty (30) days prior written notice by receipted delivery has been given to the District.
5. PROVISIONS REGARDING THE INSURED'S DUTIES. Any failure to comply with reporting provisions of the policy or breaches or violations of warranties shall not affect coverage provided to the District, its elected or appointed officers, officials employees or volunteers.
6. SCOPE OF COVERAGE. This policy, if primary, affords coverage at least as broad as:
   (1) Insurance Services Office Commercial General Liability Coverage, "occurrence" form CG 0001; or
   (2) If excess, affords coverage which is at least as broad as the primary insurance form CG 0001.

Except as stated above nothing herein shall be held to waive, alter or extend any of the limits conditions, agreements or exclusions of the policy to which this endorsement is attached.

ENDORSEMENT HOLDER

ALTADENA LIBRARY DISTRICT

AUTHORIZED REPRESENTATIVE

☐ Broker/Agent ☐ Underwriter ☐ _____

I _____ (print/type name), warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.

Signature _____
(ORIGINAL SIGNATURE REQUIRED)

Telephone: ( ) Date Signed

SUBMIT IN DUPLICATE

AUTOMOBILE LIABILITY SPECIAL ENDORSEMENT

FOR ALTADENA LIBRARY DISTRICT (the "District")

ENDORSEMENT NO:	ISSUE DATE:

PRODUCER

Telephone

POLICY INFORMATION:

Insurance Company:

Policy No.:

Policy Period : (from) (to)

LOSS ADJUSTMENT EXPENSE ☐ Included in Limits

☐ In Addition to Limits

☐ Deductible ☐ Self-Insured Retention (check which) of $_____

with an Aggregate of $ _____ applies to _____

coverage. ☐ Per Occurrence ☐ Per Claim

NAMED INSURED

APPLICABILITY. This insurance pertains to the operations and/or tenancy of the named insured under all written agreements and permits in force with the District unless checked here ☐ in which case only the following specific agreements and permits with the District are covered:
DISTRICT AGREEMENTS/PERMITS:

TYPE OF INSURANCE

☐ COMMERCIAL AUTO POLICY

☐ BUSINESS AUTO POLICY

☐ OTHER

OTHER PROVISIONS

LIMIT OF LIABILITY

$ _____
per accident, for bodily injury and property damage

CLAIMS: Underwriter's representative for claims pursuant to this insurance

Name: _____

Address: _____

Telephone _____

(____) _____

In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:

1. INSURED. The District, its elected or appointed officers, agents, volunteers and employees are included as additional insured with regard to liability and defense of suits arising from the operations, products and activities performed by or on behalf of the named insured.
2. CANCELLATION NOTICE. With respect to the interests of the District, this insurance shall not be canceled, or materially reduced in coverage or limits except after thirty (30) days prior written notice by receipted delivery has been given to the District.
3. PROVISION REGARDING THE INSURED'S DUTIES. Any failure to comply with reporting provisions of the policy or breaches or violations of warranties shall not affect coverage provided to the District, its elected or appointed officers, officials, employees or volunteers.
4. SCOPE OF COVERAGE. This policy, if primary, affords coverage at least as broad as:
   (1) If excess, affords coverage which is at least as broad as the primary insurance form CG 0001.

Except as stated above nothing herein shall be held to waive, alter or extend any of the limits conditions, agreements or exclusions of the policy to which this endorsement is attached.

ENDORSEMENT HOLDER

ALTADENA LIBRARY DISTRICT

AUTHORIZED REPRESENTATIVE ☐ Broker/Agent ☐ Underwriter ☐ _____

I _____ (print/type name), warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.

Signature _____

(ORIGINAL SIGNATURE REQUIRED)

Telephone: ( ) Date Signed

SUBMIT IN DUPLICATE

WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY SPECIAL ENDORSEMENT

FOR ALTADENA LIBRARY DISTRICT (the "District")

ENDORSEMENT NO:	ISSUE DATE:

PRODUCER	POLICY INFORMATION:
Telephone	Insurance Company: Policy No.: Policy Period : (from) (to)
NAMED INSURED	OTHER PROVISIONS
CLAIMS: Underwriter's representative for claims pursuant to this insurance Name: _____ Address:_____ _____ Telephone(_____)_____	EMPLOYERS LIABILITY LIMITS $ _____ (Each Accident) $ _____ (Disease -Policy Limit) $ _____ (Disease - Each Employee)

In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:

1. CANCELLATION NOTICE. This insurance shall not be canceled, or materially reduced in coverage or limits except after thirty (30) days prior written notice by receipted delivery has been given to the District.
2. WAIVER OF SUBROGATION. The Insurance Company agrees to waive all rights of subrogation against the District, its elected or appointed officials, agents and employees for losses paid under the terms of this policy which arise from the work performed by the Named Insured for the District.

Except as stated above nothing herein shall be held to waive, alter or extend any of the limits conditions, agreements or exclusions of the policy to which this endorsement is attached.

ENDORSEMENT HOLDER

ALTADENA LIBRARY DISTRICT	AUTHORIZED REPRESENTATIVE ☐ Broker/Agent ☐ Underwriter ☐ _____ I _____ (print/type name), warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement. Signature _____ (ORIGINAL SIGNATURE REQUIRED) Telephone: ( ) _____ Date Signed _____

CERTIFICATE OF INSURANCE

FOR ALTADENA LIBRARY DISTRICT (the "District")

ISSUE DATE (MM/DD/YY)

PRODUCER

INSURED

THIS CERTIFICATE OF INSURANCE IS NOT AN INSURANCE POLICY AND DOES NOT AMEND, EXTEND, OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

		COMPANIES	BEST'S RATING
COMPANY LETTER	**A**		
COMPANY LETTER	**B**		
COMPANY LETTER	**C**		
COMPANY LETTER	**D**		
COMPANY LETTER	**E**		

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED TO MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LET	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
	GENERAL LIABILITY				GENERAL AGGREGATE	$
	[ ] COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OPS AGGREGATE	$
	[ ] CLAIMS MADE [ ] OCCUR				PERSONAL & ADVERTISING INJURY	$
	[ ] OWNER'S & CONTRACTOR'S PROT.				EACH OCCURRENCE	$
	[ ] OTHER _____				FIRE DAMAGE (any one fire)	$
					MEDICAL EXPENSE (Any on person)	$
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT	$
	[ ] ANY AUTO					
	[ ] ALL OWNED AUTOS				BODILY INJURY (PER PERSON)	$
	[ ] SCHEDULED AUTOS					
	[ ] HIRED AUTOS				BODILY INJURY (PER ACCIDENT)	$
	[ ] NON-OWNED AUTOS					
	[ ] GARAGE LIABILITY				PROPERTY DAMAGE	$
	EXCESS LIABILITY				EACH OCCURRENCE	$
	[ ] UMBRELLA					
	[ ] OTHER THAN UMBRELLA FORM				AGGREGATE	$
	[ ] WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY				STATUTORY	$
					EACH ACCIDENT	$
					DISEASE - POLICY LIMIT	$
					DISEASE - EACH EMPLOYEE	$
	PROPERTY INSURANCE [ ] COURSE OF CONSTRUCTION				AMOUNT OF INSURANCE	$

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

PARKSIDE PEDESTRIAN ROUTE IMPROVEMENTS – PHASE 2

THE FOLLOWING PROVISIONS APPLY:

1. **None of the above-described policies will be canceled until 30 days' written notice has been given to the District at the address indicated below.**
2. **The District, its officials, officers, employees and volunteers are added as insured on all liability insurance policies listed above.**
3. **It is agreed that any insurance or self-insurance maintained by the District will apply in excess of and not contribute with, the insurance described above.**
4. **The District is named as loss payee on the property insurance policies described above, if any.**
5. **All rights of subrogation under the property insurance policy listed above have been waived against the District.**
6. **The workers' compensation insurer named above, if any, agrees to waive all rights of subrogation against the District for injuries to employees of the insured resulting from work for the District or use of the District's premises or facilities.**

CERTIFICATE HOLDER/ ADDITIONAL INSURED

ALTADENA LIBRARY DISTRICT

AUTHORIZED REPRESENTATIVE

SIGNATURE _____

TITLE _____

PHONE NO. _____

THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.

Insurer:
Policy No.:
Endorsement:

ADDITIONAL INSURED

OWNERS, LESSEES OR CONTRACTORS (FORM B)

THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART.

SCHEDULE

_____

(If no entry appears above, the information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

Modifications to ISO form CG 20 10 11 85:

1. The insured scheduled above includes the Insured's officers, officials, employees, and volunteers.
2. This insurance shall be primary as respects the insured shown in the schedule above, or if excess, shall stand in an unbroken chain of coverage excess of the Named Insured's scheduled underlying primary coverage. In either event, any other insurance maintained by the Insured scheduled above shall be in excess of this insurance and shall not be called upon to contribute with it.
3. The insurance afforded by this policy shall not be canceled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the District.

Signature-Authorized Representative

Address

PART 3: GENERAL CONDITIONS

PART 3: GENERAL CONDITIONS

SECTION 1

DEFINITIONS AND TERMS

1.01. GENERAL

Wherever the following abbreviations and terms, or pronouns in place of them, are used in these Conditions and other Contract Documents of which these Conditions are a part, the intent and meaning shall be interpreted as provided below.

1.02. ABBREVIATIONS

The following abbreviations may be used in the Contract Documents:

AASHTO	American Association of State Highway/Transportation Officials
ASTM	American Society for Testing and Materials
OSHA	Occupational Safety and Health Act of 1970

1.03. NOT USED

1.04. DEFINITIONS

The intent and meaning of the following, wherever they appear in the Contract Documents, shall be interpreted as follows:

Acceptance - The formal and final acceptance by the Architect/Engineer and the Board of the entire Contract, which has been completed in all respects in accordance with the Specifications and any, approved modifications.

Addenda - Any written change, clarification or supplement to documents issued for the Request for Proposal, issued by the District, its Architect or its Engineer prior to Proposal.

Architect – the person or entity designated by the District as its architectural representative during the course of construction, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

As Approved - The words “as approved”, unless otherwise qualified, shall be understood to be followed by the words “by the Engineer” and or “by the Architect.”

As Shown, and As Indicated - The words “as shown” and “as indicated” shall be understood to be followed by the words “on the Plans”.

Award - The decision of the District to accept the proposal of the Proposer for the Work, subject to the execution and approval of a satisfactory contract therefore and bond to secure the performance thereof and to such other conditions as may be specified or required by law.

Proposal - The offer of the Proposer for the Work when made out and submitted on the prescribed Proposal form, properly signed and guaranteed.

Proposer - Any individual, firm, partnership or corporation submitting a Proposal for the Work contemplated, and acting directly or through a duly authorized representative.

Bureau - United States Bureau of Reclamation.

Calendar Day - Each day shown on the calendar.

Change Order - Written order issued by the District to the Contractor covering changes in the Contract and establishing the bases of compensation and time adjustments for work affected by the changes.

Claim - A separate demand by the contractor for (i) a time extension, (ii) payment of money or damages arising from work done by or on behalf of the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (iii) an amount the payment of which is disputed by the District.

Contract - The written agreement covering the performance of the work and the furnishing of labor, materials, tools and equipment in the construction of the Work. The Contract shall include all Contract Documents and supplemental agreements amending or extending the work contemplated which may be required to complete the Work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments, or extensions to the contract and include addenda and change orders.

Contract Documents - Contract Documents is the collective term for all of the following documents and any other document incorporated therein by reference: Request for Proposals, Accepted Proposal, Designation of Subcontractors, Construction Contract, Payment Bond to Accompany Contract, Performance Bond to Accompany Contract, General Conditions, Supplementary and Special Conditions, (if any), Drawings (and Specifications), Addenda, Change Orders, Contractor's Certification Regarding Workers' Compensation.

Contract Provisions – Additions, revisions, special directions, and requirements peculiar to a project and not otherwise thoroughly set forth in General and/or Specifications.

Contractor - The person or persons, firm, partnership or corporation or other entity who has entered into the Contract with the District to perform the Work.

County - County of Los Angeles, California.

Date of Completion - Date of filing of the Notice of Completion with the Los Angeles County Clerk-Recorder's Office.

Date of Execution of the Contract - The date on which the Contract is signed by the District's authorized representative.

Datum - The Figures given in the Specifications or upon the drawings after the word "Elevation" or an abbreviation of it, shall mean U.S.G.S. datum, unless otherwise noted.

Days - Unless otherwise designated, days as used in the Contract Documents shall mean calendar days.

District - The Altadena Library District, also referred to as the Owner.

District Board - The Board of Trustees of the Altadena Library District.

Elevation - The figures given on the Plans or in the other Contract Documents after the word "elevation" or abbreviation of it shall mean the distance in feet above the standard datum used by the District.

Engineer - The District Engineer, or the person designated by the District as its engineering representative during the course of construction, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

Extra Work - Work other than that required either expressly or implied by the Contract in its executed form.

Notice of Completion – NOC is the recorded project completion document filed with the Los Angeles County Clerk

Or Equal - The term “or equal” shall be understood to indicate that the “equal” product be the equivalent or better than the product named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made by the Architect.

Plans or Specification Drawings - The term “Plans” or “Specification Drawings” refers to the official plans, profiles, cross sections, elevations, details, and other working drawings and supplementary drawings, or reproductions thereof, signed by the Engineer, which show the location, character, dimensions, and details of the work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets. Regardless of the method of binding, Plans shall be part of the Contract Documents.

Plant - All physical, resources, facilities, machinery, equipment, staging, tools, work and storage space other than provided by the Contract, together with subsidiary essentials and necessary maintenance for proper construction and acceptable completion of the project.

Project - The entire Work to be completed under the Contract.

Project Manager - The person designated by the District as its project management representative during the course of construction, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them. The Project Manager will be the District’s Agent unless the District designates a separate Project Manager. When a Project Manager is used for a project, the Project Manager has full authority to act as the District’s Agent unless the designation specifically states otherwise.

Shop Drawings - Drawings prepared by the fabricator or supplier showing the layout and details of components fabricated in a shop for inclusion in the permanent facility (e.g., structural steel, reinforcing steel, railings).

Site - The area upon or in which the Contractor’s operations are carried on and such other areas adjacent thereto as may be designated by the Architect.

Specifications - The term “specifications” refers to the terms, provisions, and requirements contained herein. Where reference specifications, such as those of “ASTM”, “AASHTO”, etc. have been referred to, the applicable portions of such standard specifications shall become a part of these Contract Documents.

State - State of California.

Subcontractor - The term “Subcontractor”, as employed herein, includes only those having a direct contract with the Contractor and it includes one who furnishes material worked to a special design according to the plans or specifications of this work, but does not include one who merely furnishes material not so worked and would be considered a supplier only.

Time Limits - All time limits stated in the Contract Documents are of the essence of the Contract.

Work - All the work specified, indicated, shown or contemplated in the Contract Documents to construct the improvements, including all alterations, amendments or extensions thereto made by Change Order or other written orders of the Engineer.

Working Days – A Working day is defined as any day, except Saturdays, Sundays and legal holidays of the District.

Working Drawings – Drawings furnished by the Contractor showing the layout and details of temporary construction procedures and methods of construction, and data for construction equipment which are to be employed in the construction of the permanent facility (e.g., form drawings, erection drawings, load test pile procedures, pile hammer data, etc.).

Written Notice - "Written Notice" shall be deemed to have been duly served when delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by certified U.S. mail to the last business address known to the party who gives the notice as specified in the Contract.

Whenever in the Specifications or upon the drawings the words "directed", "required", "permitted", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the Engineer is intended, and similarly the words "approved", "acceptable", "satisfactory", or words of like import, shall mean approved or acceptable to, or satisfactory to the Architect, unless otherwise expressly stated.

SECTION 2

SCOPE OF WORK

2.01. INTENT OF CONTRACT DOCUMENTS

The intent of the Contract Documents is to prescribe the details for the construction and completion of the Work, which the Contractor undertakes to perform in accordance with the terms of the Contract.

Where the Specifications and Plans describe portions of the Work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment and incidentals and do all the Work involved in performing the Contract in a satisfactory and workmanlike manner.

The technical provisions are presented in sections for convenience. However, this presentation does not necessarily delineate trades or limits of responsibility. All sections of the Specifications and Plans are interdependent and applicable to the Project as a whole.

The Contract Documents are complementary, and what is called for in any one shall be as binding as if called for in all. Anything shown on the Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings shall have the same effect as if shown or mentioned respectively in both. Any work shown on one Drawing shall be construed to be shown in all Drawings and the Contractor will coordinate the Work and the Drawings.

If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence: Change Orders; Addenda; Drawings; Supplementary and Special Conditions; Designation of Subcontractors; Construction Contract; General Conditions; Payment Bond to Accompany Contract; Performance Bond to Accompany Contract; and Contractor's Certification Regarding Workers' Compensation.

Detail Drawings take precedence over General Drawings. As between schedules and other information given on Drawings, the Schedules shall govern. If an item is shown on any Drawing and not specifically included in Technical Specifications specific to this project, the Drawing shall govern. Any conflict or inconsistency between or in the drawings shall be submitted to the Architect for clarification as soon as the Contractor becomes aware of such inconsistency.

2.02. CONTRACTOR'S UNDERSTANDING

It is understood and agreed that the Contractor has, by careful examination, satisfied itself as to the nature and location of the Work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. No verbal agreement or conversation with any officer, agent or employee of the District, either before or after the execution of this Contract, shall affect or modify any of the terms or obligations contained herein.

2.03. CHANGES IN THE WORK

(a) The District may, at any time, by written order, make changes in the Work as deemed necessary by the Architect. Such changes include, but are not limited to:

(1) In the Specifications or Plans;

(2) In the sequence, method or manner of performance of the Work;

(3) In the owner-furnished facilities, equipment, materials, services or site; and

(4) Directing acceleration of the Work.

(b) If such changes cause an increase or decrease in the Contractor's cost of, or time required for, performance of the Contract, an equitable adjustment will be made and the Contract modified in writing accordingly.

(1) Change Orders

A change pursuant to this section will be in the form of a Change Order, which will set forth the work to be done or the method by which the change and cost adjustment, if any, will be determined, and the time of completion of the work.

Upon receipt of a Change Order, the Contractor shall proceed with the ordered work. If ordered in writing by the District, the Contractor shall proceed with the work so ordered prior to actual receipt of a Change Order. A Change Order executed by the Contractor and approved by the District is an executed Change Order as that term is used throughout this section.

(2) Change Order Protests

A Change Order may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in a Change Order, which he has not executed, he shall submit a written protest to the District within fifteen (15) days after the receipt of such Change Order. The protest shall state the points of disagreement and, if possible, the quantities and cost involved.

If a written protest is not submitted, payment will be made as set forth in the Change Order. Such payment shall constitute full compensation for all work included therein or required thereby. Such unprotested Change Orders shall be considered as executed Change Orders.

Where the protest concerning a Change Order relates to compensation, the compensation payable for all work specified or required by said Change Order to which such protest relates will be determined in the same manner as provided in Section 2.04 of this section. The Contractor shall keep full and complete records of the cost of such work and shall permit the District to have such access thereto as may be necessary to assist in the determination of the compensation payable for such work. Where the protest concerning a Change Order relates to the adjustment of time and for completion of the Work, the time to be allowed therefor will be determined as provided in this section.

The consent of the Contractor's sureties shall not be required as to any change or Extra Work, and the liability of the Contractor's Bonds shall be increased or decreased accordingly without notice to the sureties.

2.04. PROCEDURES AND ALLOWABLE COSTS ON CHANGES AND ADDITIONS TO WORK

(a) Forms of Payment

If the change in, or addition to, the Work will result in an increase in the contract sum, the District shall have the right to require the performance thereof. The compensation to be paid for any such work shall, in the District's sole discretion, be determined in one or more of the following ways:

(1) By extension of agreed unit prices, if unit prices are required by the District's Proposal form and provided with contractor's Proposal;

(2) By revision of unit prices;

(3) By proposal and acceptance of an agreed upon lump sum; and

(4) On a force account basis.

Until one of the above methods is agreed on, or if the Work is to be paid for on a time and materials basis, the Contractor shall keep full and complete records of the cost of such work in the form and manner prescribed by the District and shall permit the District to have access to such records as may be necessary to assist in the determination of the compensation payable for such work.

(b) Lump Sum Payment

The District, in its sole and absolute discretion, may request a lump sum proposal by Contractor to perform the change in, or addition to, the Work performed. Such lump sum proposal shall be submitted by the Contractor within ten (10) days of the District's request therefor. Request for a lump sum proposal by District shall not be deemed an election by District to have the Work performed on a lump sum basis. Costs of preparing the proposal shall not be compensable.

(1) Contents of Lump Sum Proposal

(2) The Contractor's proposal shall be itemized and segregated by labor and materials for the various components of the change (no aggregate labor total will be acceptable). The proposal shall be accompanied by signed proposals of any Subcontractors, which will perform any portion of the change, and of any persons who will furnish materials or equipment for incorporation therein. The proposal shall also include the Contractor's estimate of the time required to perform said changes or additional work.

(3) Computation of Labor Costs

The portion of the proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include the projected wages of the reasonably anticipated Site labor, including foremen, who will be directly involved in the change in the Work. These

projected wages shall not include charges for assistant superintendents, superintendents, office personnel, timekeepers and maintenance mechanics.

Labor costs may also include Contractor's overhead and profit which shall be computed by adding to the labor costs either up to fifteen percent (15%) of the projected wages, but not payroll costs, or the labor surcharge set forth in the California Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the Work is accomplished and which is a part of the Contract. The method of computing the overhead and profit shall be solely within the discretion of the District.

The labor surcharge, if used, shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workmen, other than actual wages as defined above. No time or charges will be allowed except when the workers are actually engaged in the proper, efficient and diligent performance or completion of the extra work as authorized. Overtime shall not be worked without prior approval of the Engineer.

(4) Computation of Equipment and Materials Costs

The portion of the proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the change in the Work. This portion of the proposal may also include transportation and applicable sales or use taxes. Up to fifteen percent (15%) of these direct costs may be included as overhead and profit for the Contractor or any such Subcontractor (such overhead and profit to include all small tools).

This portion of the proposal may further include the Contractor's and any of its Subcontractors' reasonably anticipated costs for the rental and operation of prime construction and automotive equipment furnished and used in connection with the change in the Work. The equipment rental and operation rates used shall be the latest edition of the Department of Transportation, Division of Construction, Equipment Rental Rates. These costs shall not include charges for listed equipment or major tools with a new cost of five hundred dollars ($500) or less. No time charges shall be allowed except for equipment actually used for the proper and efficient performance or completion of the authorized change in the Work.

(5) Subcontractors

The lump sum proposal may include up to five percent (5%) of the amount, which the Contractor will pay to any of its Subcontractors for the change in the Work as allowable overhead and profit to the Contractor.

(6) Failure to Submit Lump Sum Proposal

In the event that the Contractor fails to submit its proposal within the designated period, the District may direct the Contractor to proceed with

the change or addition to the Work and the Contractor shall so proceed. The District shall unilaterally determine the reasonable costs and time to perform the work in question, which determination shall be final and binding upon the Contractor.

(7) Failure to Agree on Lump Sum Amount

In the event that the parties are unable to agree as to the reasonable costs and time to perform the change in or addition to the Work based upon the Contractor's proposal and the District's Representative and District do not elect to have the change in the Work performed on a time and material basis, the District's Representative and District shall make a unilateral determination of the reasonable cost and time to perform the change in the Work, based upon their own estimates, the Contractor's submission or combination thereof. In such instances, a Change Order shall be issued for the amount of costs and time determined by the District's Representative and the District and shall become binding upon the Contractor unless the Contractor submits its protest in writing to the District within thirty (30) days of the issuance of the Change Order. The District has the right to direct the Contractor in writing to perform the change in the Work, which is the subject of the Change Order. Failure of the parties to reach agreement regarding the costs and time of performing the change in the Work and/or any pending protest shall not relieve the Contractor from performing the change in the Work promptly and expeditiously.

(c) Payment by Unit Prices

If any of the items included in the lump sum proposal are covered by unit prices contained in the contract document, the District may, if it requires the change in the Work to be performed on a lump sum basis, elect to use these unit prices in lieu of the similar items included in the lump sum proposal in which event an appropriate deduction will be made in the lump sum amount prior to the application of any allowed overhead and profit percentages. No overhead and profit shall be applied to any unit prices.

(d) Payment on a Force Account Basis

If the District elects to have the change or addition to the Work performed on a force account basis, the Work shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors or Sub-subcontractors, and payment shall be made subject to the following provision. The Contractor will be paid the direct costs of the labor, equipment and materials used in performing the force account work determined as hereinafter provided.

(1) For labor, the Contractor will be paid the cost of labor for the workers (including foremen when authorized by the District's Representative) used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor or any or any subcontractor of any tier, shall be actual wages, including basic hourly wage, health and welfare payments and pension payments incurred in performing the force account work, plus any travel and subsistence payments for the workers performing such work and made necessary thereby. To the actual wages shall be added a labor surcharge as set forth in the State Department of Transportation publication entitled "Labor Surcharge and Equipment

Rental Rates", as in effect on the date the work is performed. The labor surcharge shall be deemed to encompass the District's entire liability to reimburse the Contractor for workers compensation insurance payments, social security payments, Medicare payments, federal unemployment insurance payments, state unemployment insurance payments and state training taxes, made necessary by the force account work.

(2) For equipment, the Contractor will be paid for the use of equipment at the rental rates listed for that equipment in the State Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates", which is in effect on the date the work is performed, regardless of ownership or any rental agreement entered into by Contractor for such equipment. The rental rate paid in accord with said publication shall be deemed to include the cost of fuel, oil, lubrication, supplies, small tools, attachments, repairs and maintenance, depreciation, storage and insurance for said equipment. Rental time will not be paid when equipment is inoperable due to breakdowns, repairs or maintenance.

(3) For materials used in the work, the District will pay for materials furnished by the Contractor and necessarily used in the force account work. Prior to markups as set forth below, the amount paid shall be the price paid by the actual purchaser to the actual supplier plus any necessary actual costs of handling the materials.

Contractor may add fifteen percent (15%) to the total labor, equipment and material charges as the total overhead and profit to the entity or entities actually performing the force account work. If the entity or entities actually performing the work are Subcontractors or Sub-subcontractors, the Contractor shall be allowed five percent (5%) of the total charge of the performing entity or entities (including mark- up) as Contractor's mark-up. No other mark-ups shall be allowed hereunder.

The Contractor shall submit to the District daily work and material tickets, to include the identification number assigned to the change in the Work, the location and description of the change in the Work, the classification of labor employed (and names and social security numbers), hours expended, the material used, the equipment rented (not tools) and such other evidence of cost as the District may require. The District may require authentication of all time and material tickets and invoices by persons designated by the District for such purpose. The failure of the Contractor to secure any required authentication shall, if the District elects to treat it as such, constitute a waiver by the Contractor of any claim for the cost of that portion of the Change in the Work covered by a non-authenticated ticket or invoice; provided, however, that the authentication of any such ticket or invoice by the District shall not constitute an acknowledgment by the District that the items thereon were reasonably required for the Change in the Work.

(e) Limitations on Changes

The Contractor shall not be entitled to any amount for indirect costs, damages or expenses of any nature, including, but not limited to, so-called "impact" costs, labor

inefficiency, wage, material or other escalations beyond the prices upon which the proposal is based and to which the parties have agreed pursuant to the provisions of this section, and which the Contractor, its Subcontractors and Sub-subcontractors or any other person may incur as a result of delays, interferences, suspensions, changes in sequence or the like, for whatever cause, whether reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, arising from the performance of any and all changes in the work performed pursuant to this section. It is understood and agreed that the Contractor's sole and exclusive remedy in such event shall be recovery of its direct costs as compensable hereunder and an extension of the time of the Contract, but only in accordance with the provisions of the Contract Documents.

It is expressly agreed that Contractor shall not be entitled to claim damages for anticipated profits on any portion of the Work that may be deleted.

The amount of any adjustment for work deleted shall be estimated at the time deletion of work is ordered and the estimated adjustment will be deducted for the subsequent monthly pay estimates. The District reserves its rights under Section 3.18 to audit Contractor's as-proposed profit in connection with any deductive change, to arrive at a final adjustment. Contractor's as-proposed profit shall be reduced pro rata according to the proportion of the original contract value less as-proposed profit, represented by the work deleted.

The District reserves the right to contract with any person or firm other than the Contractor for any or all Extra Work.

2.05. UNILATERAL CHANGE IN OR ADDITION TO THE WORK

Notwithstanding the above, the District, directly or through the District's Representative, may direct the Contractor in writing to perform changes in or additions to the scope of the Contract. The Contractor shall perform such work and the parties shall proceed pursuant to the provisions of Section 2.04.

2.06. DIFFERING SITE CONDITIONS

The Contractor shall promptly, and before the following conditions are disturbed, notify the District in writing of any:

(a) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25110.02 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; or

(b) Subsurface or latent physical conditions at the Site differing from those indicated in the Contract Documents; or

(c) Unknown conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Architect/Engineer shall thereupon promptly investigate the conditions. If the Engineer finds that they do involve hazardous waste, or do materially differ and cause an decrease or increase in the Contractor's cost or time of performance, the District will issue a change order as appropriate. Any increase or decrease of cost resulting from such changes shall be adjusted in the manner provided in Section 2.04 for adjustments as to extra and/or additional work and changes. In the event that a dispute arises between the District and the

Contractor, whether the conditions materially differ, or involve hazardous waste, or cause and decrease or increase the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided by the Contract, but shall proceed with all work to be performed under the Contract, the procedures applicable to claims for extra costs shall then apply.

2.07. CLAIMS FOR EXTRA COSTS

(a) Notice of Potential Claims

(1) It is hereby mutually agreed that the Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the District, or the happening of any event, thing or occurrence, unless the Contractor provides the District with written notice of the potential claims as hereinafter specified. Compliance with this section, however, shall not be a prerequisite as to matters within the scope of the protest provisions in Section 2.03.

(2) The written notice of potential claims shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. The notice as above required shall be given to the District prior to the time that the Contractor commences performance of the Work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the District, or in all other cases within ten (10) days after the happening of the event, thing or occurrence giving rise to the potential claim.

(b) Resolution of Claims

(1) Submission of Claims. The Contractor may file a written claim, as defined by Public Contract Code section 9204(c)(1), with the Owner including reasonable documentation to support the claim. Upon receipt of the claim, the Owner shall conduct a reasonable review of the claim, and within a period not to exceed forty-five (45) days, the Owner shall provide the Contractor with a written statement identifying what portion of the claim is disputed and what portion is undisputed. The time in which the Owner must provide a written statement may be extended by mutual agreement of the parties as specified by Public Contract Code section 9204(d)(1)(C). The Owner shall pay any undisputed portion of the claim within sixty (60) days after issuance of its written statement.

(2) Meet And Confer Regarding Unresolved Formal Claim. If the Contractor disputes the Owner's written statement issued pursuant to Section 2(7)(b)(1) or if the Owner fails to issue a timely written response, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the Owner shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute. The meet and confer conference shall be attended by senior executives of the parties who have authority to settle the controversy. Within ten (10) business days following the conclusion of the meet and confer conference, the Owner

shall provide the Contractor with a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. The Owner shall pay any undisputed portion of the claim within sixty (60) days after it issues its written statement.

(3) Mediation. If the Contractor disputes, in writing, any portion of the Owner's written statement as issued under Section 2(7)(b)(2), the disputed items shall be submitted to nonbinding mediation according to the provisions of Public Contract Code section 9204(d)(2), and any costs of mediation shall be allocated as set forth in that section. Upon receipt of a claim, the Owner and the Contractor may agree to waive, in writing, mediation.

(4) Failure to Respond or Pay. If the Owner fails to timely respond to a claim from the Contractor or otherwise fails to meet the time requirements of Public Contract Code section 9204, the claim shall be deemed rejected in its entirety. Additionally, amounts not timely paid in the manner required by Public Contract Code section 9204 shall bear interest at seven (7) percent per annum.

(5) Subcontractor Claims. If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against the Owner because privity of contract does not exist, the Contractor may present to the Owner a claim on behalf of the subcontractor or lower tier subcontractor pursuant to Public Contract Code section 9204(d)(5).

(6) Government Claims Act. If, following compliance with the requirements with Section 2(7)(b)(1-5), the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits its written claim pursuant to subdivision (a) until the time the claim is denied, including any period of time utilized by the meet and confer conference

2.08. DISPUTES

Except as otherwise specifically provided in the Contract Documents, the District will initially decide all claims of the Contractor and all disputes arising under and by virtue of the Contract. Such claim or dispute will be processed and decided by the District as soon as practicable after its submission and the submission or availability of any additional information necessary to its decision. If the Contractor is dissatisfied with the District's decision, the Contractor may, within fifteen (15) days from the date of the District's decision, follow the procedures set forth in Section 2.07. If the Contractor fails to follow the procedures set forth in Section 2.07 within the fifteen (15)-day period, then the District's decision shall be final, conclusive and binding on the Contractor.

2.09. GUARANTEE

(a) In addition to warranties, representations and guarantees stated elsewhere in the Contract Documents, the Contractor unconditionally guarantees all materials and workmanship furnished hereunder, and agrees to replace the same at

its sole cost and expense, and to the satisfaction of the Engineer, any and all materials which may be defective or improperly installed.

(b) The Contractor shall repair or replace to the satisfaction of the District any or all such work that may prove defective in workmanship or materials, ordinary wear and tear excepted, together with any other work, which may be damaged or displaced in so doing.

(c) In the event of failure to comply with the above stated conditions within a reasonable time, the District is authorized to have the defect repaired and made good at the expense of the Contractor who will pay the costs and charges therefore immediately upon demand, including any reasonable management and administrative costs, and engineering, legal and other consultant fees incurred to enforce this section.

(d) The signing of the Contract by the Contractor shall constitute execution of the above guarantees. Except as otherwise provided in this Contract, the guarantees and warranties shall remain in effect for a period of one (1) year after final acceptance of the Work by the District.

SECTION 3

CONTROL OF WORK

3.01. AUTHORITY OF DISTRICT'S REPRESENTATIVE

(a) The District's Representative is the representative of the District and has full authority to interpret the Contract Documents, to conduct the construction review and inspection of the Contractor's performance, and to decide questions, which arise during the course of the Work and the District's Representative's decisions on these matters, shall be final and conclusive. The District's Representative has the authority to reject all work and materials, which do not conform to the Contract Documents, and has the authority to stop the Work whenever such stoppage may be necessary to insure the proper execution of the Contract. The District's Representative's failure to stop the Work shall not obligate the District to accept defective or otherwise unacceptable work or otherwise affect the District's Representative's or District's authority to reject work for any reason set forth in the Contract Documents.

(b) If at any time the Contractor's work force, tools, plant or equipment appear to the District's Representative to be insufficient or inappropriate to secure the required quality of work or the proper rate of progress, the District's Representative may order the Contractor to increase their efficiency, improve their character, to augment their number or to substitute other personnel, new or additional tools, plant or equipment, as the case may be, and the Contractor shall comply with such order. Neither the failure of the District's Representative to demand such increase of efficiency, number, or improvement, nor the compliance by the Contractor with the demand, shall relieve the Contractor of its obligation to provide quality work at the rate of progress necessary to complete the Work within the specified time.

(c) The District's Representative may authorize minor variations in the work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time. These may be accomplished by a Field Order. Contractor shall comply promptly with all Field Orders. If the District's Representative and Contractor are unable to agree on entitlement or on the amount or extent, if any, of any adjustment in the Contract Price or Contract time, or cost, as a result of a Field Order, a claim may be made therefor pursuant to Section 2.07.

(d) Any order given by the District's Representative, not otherwise required by the Contract Documents to be in writing shall, on request of the Contractor, be given or confirmed by the Engineer in writing.

(e) Whenever work, methods of procedure, or any other matters are made subject to direction or approval, such direction or approval will be given by the District's Representative.

(f) If the Contractor, in the course of the Work, finds any discrepancy between the Drawings and the physical condition of the locality, or any errors or omissions in the Drawings, or in the layout as given by points and instructions, it shall be the Contractor's duty to inform the Architect in writing, and the Architect will promptly verify the same.

Any work done after such discovery, until authorized, will be done at the Contractor's risk. All Drawings, Specifications, and copies thereof furnished by the Architect are the property of the Architect and shall not be reused on other work and, with the exception of the signed Contract sets, are to be returned to the Architect, on request, at the completion of the Work. All models are the property of the District.

(g) The Drawings shall be supplemented by such Shop Drawings prepared by the fabricator and/or supplier and Working Drawings prepared by the Contractor as are necessary to adequately control the Work. No changes shall be made by the Contractor in any Shop or Working Drawings after they have been reviewed by the Architect, if the Architect deems that no further submittals are necessary. The Contractor shall not commence the layout, purchase, fabrication, or construction of any work for which Shop or Working Drawings are required until Engineer has reviewed the specifications and drawings and has indicated in writing no further submittals are required for compliance with the Contract Documents.

(h) Shop and Working Drawings for any structure shall include, but not be limited to, detail design calculations, fabrication and installation drawings, lists, graphs, operating instructions, etc., which shall be reviewed and accepted by the Architect before any such work is performed.

(i) Shop and Working Drawings will be required for cribs, cofferdams, falsework, centering and form work and for other temporary work and methods of construction the Contractor proposes to use. Such Drawings shall be subject to the review and acceptance of the Architect insofar as the details affect the character of the finished work, but details of design will be left to the Contractor who shall be responsible for the successful construction of the Work.

(j) Contractor agrees that Shop and/or Working Drawings processed by the Architect are not Change Orders; that the purpose of these Drawings submitted by the Contractor is to demonstrate to the Architect that the Contractor understands the design concept, that the Contractor demonstrates its understanding by indicating which equipment and material the Contractor intends to furnish and by detailing the fabrication methods it intends to use. It is expressly understood, however, that favorable review of the Contractor's Shop and Working Drawings shall not relieve the Contractor of any responsibility for accuracy of dimensions and details, or for mutual agreements of dimensions and details. It is mutually agreed that the Contractor shall be responsible for agreement and conformity of its Drawings with the Specifications. Contractor further agrees that if deviations, discrepancies or conflicts between Shop and/or Working Drawings and Specifications are discovered either prior to or after the Drawings are processed by the Architect, the Specifications shall control and shall be followed.

(k) Unless otherwise stated, the Architect shall have thirty (30) days from the date of receipt of Shop and/or Working Drawings for review.

(l) Full compensation for furnishing all Shop and/or Working Drawings shall be considered as included in the prices paid for the Contract items of work to which such drawings relate and no additional compensation will be allowed therefore. Any cost related to the Architect's review of any particular set of Shop and/or Working Drawings more than twice, due to incompleteness or unacceptability, shall be borne by the Contractor, and the District reserves the right to withhold such costs from payments due the Contractor.

(m) All reasonable effort has been made to locate and delineate all known structures and facilities on the plans. Except as otherwise provided herein, the District shall assume no responsibility for the completeness or accuracy of its delineation of underground utilities nor the existence of other buried objects which may be encountered, or which are not shown on the plans.

(n) The Contractor shall keep and maintain a clean set of plans for the project and shall record in red ink all changes, revisions, etc. made during the course of construction. These plans shall include all changes, revisions, etc. from the original plan complete with the exact sizes, locations, dimensions, elevations, etc. These plans shall be kept and maintained in a neat, clean and legible condition and shall be available for inspection at all times by the Architect. The Contractor shall deliver these completed plans to the Architect and the Architect shall approve these plans prior to final acceptance of the project by the District.

3.02. PERMITS AND REGULATIONS

Permits and licenses, of a temporary or permanent nature, necessary for the prosecution of the Work shall be secured and paid for by the Contractor.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as shown on the plans and described in the Specifications. Contractor shall promptly notify the Architect in writing of any specification at variance therewith. In such instances, any necessary changes shall be adjusted as provided in the Contract for changes in the Work. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules, and regulations and without such notice to the Architect, Contractor shall bear all costs arising therefrom.

3.03. CONFORMITY WITH CONTRACT DOCUMENTS AND ALLOWABLE DEVIATIONS

Work and materials shall conform to the lines, grades, cross sections, dimensions and material requirements, including tolerances, shown on Contract Documents. Although measurement, sampling, and testing may be considered evidence as to such conformity, the Architect shall be the sole judge as to whether the Work or materials deviate from the Contract Documents. The Architect's decision as to any allowable deviations therefrom shall be final and conclusive.

3.04. COORDINATION AND INTERPRETATION OF CONTRACT DOCUMENTS

(a) Should it appear that the Work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Specifications and Plans, the Contractor shall apply to the Architect for such further explanations as may be necessary and shall conform to them as part of the Contract. In the event of any doubt or question arising respecting the true meaning of the Specifications and Plans, reference shall be made to the Architect, whose decision thereon shall be final and conclusive.

(b) Any reference made in the Specifications and Plans to any specification, standard, method, or publication of any scientific or technical society or other organization shall, in the absence of a specific designation to the contrary, be understood to refer to the specification, standard, method, or publication in effect as of the date that the Work is advertised for Proposals.

3.05. SUBCONTRACTORS

(a) The attention of the Contractor is directed to the provisions of California Public Contract Code sections 4100-4113 regarding subcontracting and said provisions are by this reference incorporated herein and made a part hereof.

(b) Each subcontract shall contain a suitable provision for the suspension or termination thereof should the Work be suspended or terminated or should the Subcontractor neglect or fail to conform to every provision of the Contract Documents insofar as such provisions are relevant. The Contractor shall be fully responsible to the District for the acts or omissions of the Contractor's Subcontractors and of the persons either directly or indirectly employed by the Contractor. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the District. If a legal action, including arbitration and litigation, against the District is initiated by a Subcontractor or Supplier, the Contractor shall reimburse the District for the amount of legal, engineering and all other expenses incurred by the District in defending itself in said action.

(c) The District, the District's Representative and the Architect reserve the right to approve all Subcontractors.

Such approval shall be a consideration to the awarding of the Contract and unless notification to the contrary is given to the Contractor prior to the signing of the Contract, the list of Subcontractors which is submitted with the Contractor's proposal will be deemed to be acceptable. Contractor shall not, without the written consent of the District, subcontract the whole of the Work.

3.06. COOPERATION OF CONTRACTORS

(a) Should construction be under way by other forces or by other contractors within or adjacent to the limits of the Work specified or should work of any other nature be under way by other forces within or adjacent to said limits, the Contractor shall cooperate with all such other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserve d to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

(b) When two or more contractors are employed on related or adjacent work, each shall conduct its operation in such a manner as not to cause any unnecessary delay or hindrance to the other. Each contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by its operations, and for loss caused the other due to unnecessary delays or failure to finish the work within the time specified for completion.

3.07. SUPERINTENDENCE

(a) The Contractor shall designate in writing, before starting work, an individual as authorized representative who shall have the authority to represent and act for the Contractor. This authorized representative shall be present at the Site of the Work at all times while work is actually in progress on the Contract. When the Work is not in progress and during periods when the Work is suspended, arrangements acceptable to the District shall be made for any emergency work, which may be required.

(b) The Contractor is solely responsible, at all times, for the superintendence of the Work and for its safety and progress.

(c) Whenever the Contractor or its authorized representative is not present on any particular part of the Work where it may be desired to give direction, orders will be given by the District, which shall be received and obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given.

(d) Any order given by the District, not otherwise required by the Specifications to be in writing, will on request of the Contractor, be given or confirmed by the District in writing.

3.08. INSPECTION OF WORK

(a) Unless otherwise provided, all equipment, materials, and work shall be subject to inspection and testing by the Architect /Engineer & District's 3rd Party Testing Agency. The Architect /Engineer & District's 3rd Party Testing Agency will observe the progress and quality of the Work and determine, in general, if the Work is proceeding in accordance with the intent of the Contract Documents. The Architect /Engineer & District's 3rd Party Testing Agency shall not be required to make comprehensive or continuous inspections to check the quality of the Work. The Architect /Engineer & District's 3rd Party Testing Agency shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work. Visits and observations made by the Architect /Engineer & District's 3rd Party Testing Agency shall not relieve the Contractor of Contractor's obligation to conduct comprehensive inspections of the Work and to furnish proper materials, labor, equipment and tools, and perform acceptable work, and to provide adequate safety precautions, in conformance with the intent of the Contract.

(b) Whenever the Contractor varies the period during which work is carried on each day, the Contractor shall give due notice to the Architect /Engineer & District's 3rd Party Testing Agency so that proper inspection may be provided. Any work done in the absence of the Architect /Engineer & District's 3rd Party Testing Agency shall be subject to rejection. Proper facilities for safe access for inspection to all parts of the Work shall at all times be maintained for the necessary use of the Architect /Engineer & District's 3rd Party Testing Agency and other agents of the District, and agents of the federal, state, or local governments at all reasonable hours for inspection by such agencies to ascertain compliance with laws and regulations.

(c) One or more inspectors may be assigned to observe the Work by the Architect /Engineer & District's 3rd Party Testing Agency and to act in matters of construction under this Contract. It is understood that inspectors shall have the power to issue instructions and make decisions within the limitations of the authority of the Architect /Engineer & District's 3rd Party Testing Agency. Such inspection shall not relieve the Contractor of the Contractor's obligation to conduct comprehensive inspections of the Work, to furnish proper materials, labor, equipment and tools, and perform acceptable work, and to provide adequate safety precautions in conformance with the intent of the Contract.

(d) The Architect /Engineer & District's 3rd Party Testing Agency and the Architect /Engineer & District's 3rd Party Testing Agency's representatives shall at all

times have access to the Work wherever it is in preparation or progress, and the Contractor shall provide safe and convenient facilities for such access and for inspection. If the Specifications, the Architect /Engineer & District's 3rd Party Testing Agency's instructions, laws, ordinances, or any public authority require any material, equipment or work to be specifically tested or approved, the Contractor shall give the Architect /Engineer & District's 3rd Party Testing Agency timely notice of its readiness for inspection, and if the inspection is by an authority other than the District, of the time fixed for inspection. Inspections by the Architect /Engineer & District's 3rd Party Testing Agency will be made promptly and, where practicable, at the source of supply.

(e) Work performed without inspection may be required to be removed and replaced under proper inspection. In such instances, the entire cost of removal and replacing, including the cost of District-furnished materials used in the Work, shall be borne by the Contractor, regardless of whether or not the Work exposed is found to be defective. Examination of questioned work, other than that installed without inspection, may be ordered by the Architect /Engineer & District's 3rd Party Testing Agency and, if so ordered, the Work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the District will pay the cost of re-examination and replacement. If such work is found to be not in accordance with the Contract Documents, the Contractor shall pay such cost, unless the Contractor can show that the defect in the Work was caused by another contractor, and in that event the District will pay such costs.

(f) The inspection of the Work shall not relieve the Contractor of the Contractor's obligation to fulfill the Contract as herein prescribed, or in any way alter the standard of performance provided by the Contractor, and defective work shall be made good and unusable materials may be rejected, notwithstanding that such work and materials have been previously overlooked by the Architect /Engineer & District's 3rd Party Testing Agency and accepted or estimated for payment. If the Work or any part thereof shall be found defective, the Contractor shall, within ten (10) calendar days, make good such defect in a manner satisfactory to the Architect /Engineer & District's 3rd Party Testing Agency. If the Contractor fails to make ordered repairs of defective work or to remove the condemned materials from the Work within ten (10) calendar days after written direction by the Architect /Engineer & District's 3rd Party Testing Agency, the District may make the ordered repairs, or remove the condemned materials, and deduct the cost thereof from any monies due the Contractor.

(g) The Contractor shall furnish promptly, without additional charge, all facilities, labor and materials reasonably needed by the Architect /Engineer & District's 3rd Party Testing Agency for performing all inspection and tests. Contractor shall be charged with any additional cost of inspection when material and workmanship are not ready at the time specified by the Contractor for its inspection.

(h) Where any part of the Work is being done under an encroachment permit or building permit, or is subject to federal, state, county or District codes, laws, ordinances, rules or regulations, representatives of the government agency shall have full access to the Work and shall be allowed to make any inspection or tests in accordance with such permits, codes, laws, ordinances, rules, or regulations. If advance notice of the readiness of the Work for inspection by the governing agency is required, the Contractor shall furnish such notice to the appropriate agency.

(i) The Architect /Engineer & District's 3rd Party Testing Agency may inspect the production of material, or the manufacture of products at the source of

supply. Plant inspection, however, will not be undertaken until the Architect /Engineer & District's 3rd Party Testing Agency is assured of the cooperation and assistance of both the Contractor and the material producer. The Architect /Engineer & District's 3rd Party Testing Agency or the Architect /Engineer & District's 3rd Party Testing Agency's authorized representative shall have free entry at all times to such parts of the plant as concerns the manufacture or production of the materials. Adequate facilities shall be furnished free of charge to make the necessary inspection. The District assumes no obligation to inspect materials at the source of supply.

3.09. TESTS

The District shall perform, at the District's own expense, all tests specified or required by the Specifications. The Engineer may perform such tests as the Engineer deems necessary to determine the quality of work or compliance with Contract Documents. The Contractor shall furnish promptly without additional charge all facilities, labor, and material reasonably required for performing safe and convenient tests as may be required by the Engineer. All tests by the Engineer will be performed in such a manner as will not unnecessarily delay the Work. The Contractor shall not be required to reimburse the District for tests performed by the District or Engineer. If samples of materials are submitted which fail to pass the specified tests, the Contractor shall pay for all subsequent tests. The District is responsible for the 3rd party testing.

3.10. REMOVAL OF REJECTED AND UNAUTHORIZED WORK AND MATERIALS

(a) All work or materials, which have been rejected, shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation shall be allowed the Contractor for such removal, replacement, or remedial work.

(b) Any work done beyond the lines and grades shown on the plans or established by the Architect or any Extra Work done without written authority will be considered as unauthorized work and will not be paid for. Upon order of the Architect or District Representative, unauthorized work shall be remedied, removed, or replaced at the Contractor's expense.

(c) Upon failure of the Contractor to comply with any order of the Architect or District Representative made under this section, the District may cause rejected or unauthorized work to be remedied, removed, or replaced, and may deduct the costs therefore from any monies due or to become due the Contractor.

3.11. DEDUCTIONS FOR UNCORRECTED WORK

If the Architect or District Representative deems it inexpedient to correct work damaged or not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore, and such sum may be withheld by the District from Contractor's payment.

3.12. EQUIPMENT AND PLANTS

(a) Only equipment and plants suitable to produce the quality of work and materials required will be permitted to operate on the Project.

(b) Plants will be designed and constructed in accordance with general practice for such equipment and shall be of sufficient capacity to insure the production of sufficient material to carry the Work to completion within the time limit.

(c) The Contractor shall provide adequate and suitable equipment and plants to meet the above requirements, and when ordered by the Architect or District Representative, shall remove unsuitable equipment from the Work and discontinue the operation of unsatisfactory plants. Contractor shall, upon request of the Architect or District Representative, submit one or more lists identifying, by make, model number, contractor's identification number and empty gross weight, each piece of operable equipment used for the Work. Contractor shall, upon request of the Architect or District Representative, submit documentation establishing that any measuring device used for the Work has been tested and properly approved under California Test 109.

(d) In the case of termination of this Contract before its completion for any cause whatsoever, the Contractor, if notified to do so by the District, shall promptly remove any part or all of its equipment and supplies from the property of the District. If the Contractor fails to do so, the District shall have the right to remove such equipment and supplies at the expense of the Contractor.

3.13. CHARACTER OF WORKER

If any Subcontractor, or person employed by the Contractor or any Subcontractor fails or refuses to carry out the directions of the Architect or District Representative or appears to the Architect or District Representative to be incompetent or to act in a disorderly or improper manner, said person shall be removed from the Project immediately on the requisition of the Architect or District Representative. That person shall not again be employed on the Work. Such discharge shall not be the basis for any claim for compensation or damages against the District, or any of its officers or agents.

3.14. SEPARATE CONTRACTS

(a) The District reserves the right to let other contracts in connection with this Work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate Contractor's work with the other contractor's work.

(b) If any part of the Contractor's work depends on proper execution or results upon the Work of any other contractor, the Contractor shall inspect and promptly report to the District Representative any defects in such work that render it unsuitable for such proper execution and results. The Contractor's failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the Contractor's work, except as to defects which may develop in the other contractor's work after the execution of the Contractor's work.

(c) To insure the proper execution of Contractor's subsequent work, the Contractor shall measure work already in place and shall at once report to the District Representative any discrepancy between the executed work and the Drawings.

3.15. ASSIGNMENT

The Contractor shall not assign the Contract or sublet it as a whole or in part without the written consent of the District, nor shall the Contractor assign any monies due, or to become due to the Contractor hereafter without the prior written consent of the District.

3.16. USE OF COMPLETED PORTIONS, RIGHT TO OPERATE UNSATISFACTORY EQUIPMENT OR FACILITIES

(a) The District may, at any time, and from time to time, during the performance of the Work, enter the Work Site for the purpose of installing any necessary work by District labor or other contracts, and for other purpose in connection with the installation of facilities. In doing so, the District shall endeavor not to interfere with the Contractor and the Contractor shall not interfere with other work being done by or on behalf of the District.

(b) If, prior to completion and final acceptance of all the Work, the District takes possession of any structure or facility (whether completed or otherwise) comprising a portion of the Work with the intent to retain possession thereof (as distinguished from temporary possession contemplating the return to the Contractor), then, while the District is in possession of the same, the Contractor shall be relieved of liability for loss or damage to such structure other than that resulting from the Contractor's fault or negligence. Such taking of possession by the District shall not relieve the Contractor from any provisions of this Contract regarding such structure, other than to the extent specified in the preceding sentence, nor shall such taking constitute a final acceptance of such structure or facility.

(c) If, following installation of any equipment or facilities furnished by the Contractor, defects requiring correction by the Contractor are found, the District shall have the right to operate such unsatisfactory equipment or facilities and make reasonable use thereof until the equipment or facilities can be shut down for correction of defects without injury to the District.

3.17. LANDS FOR WORK, RIGHT-OF-WAY CONSTRUCTION ROADS

(a) The District will provide the lands, easements, right-of-way, and/or encroachment permits necessary or other rights to enter and work on lands necessary for the performance of the Work. Other permits and licenses are addressed by Section 3.02. Should the Contractor find it advantageous to use any additional land for any purpose whatever, the Contractor shall provide for the use of such land at its expense. The District or District Representative shall be furnished with a copy of written agreements or otherwise be notified in writing of additional working space which is acquired. Nothing herein contained and nothing marked on the Plans shall be interpreted as giving the Contractor exclusive occupancy of the territory provided by the District. When two or more contracts are being executed at one time on the same or adjacent land in such a manner that work on one contract may interfere with that on another, the District or District Representative shall decide which contractor shall cease work, and which shall continue, or whether the work on both contracts shall progress at the same time and in what manner, and the decision of the District or District Representative shall be final and binding. When the territory of one contract is the necessary or convenient means of access for the performance of another contract, such privilege of access or any other reasonable privilege may be granted by the District or District Representative to the contractor so desiring, to the extent, amount,

in the manner, and at the time permitted. No such decision as to the method or time of conducting the Work or the use of territory shall be the basis of any claim for delay or damage.

(b) Lands, easements or rights-of-way to be furnished by the District for construction operations will be specifically shown on the Plans.

(c) The Contractor shall construct and maintain all roads necessary to reach the various parts of the Work and for the transportation thereto of construction material and personnel. The cost of constructing and maintaining such roads shall be borne by the Contractor.

3.18. DISTRICT'S RIGHT TO AUDIT AND PRESERVATION OF RECORDS

(a) The Contractor shall maintain books, records and accounts of all costs in accordance with generally accepted accounting principles and practices. The District and its authorized representatives shall have the right to audit the books, records and accounts of the Contractor under any of the following conditions:

(1) The Contract is terminated for any reason in accordance with the provisions of the Contract Documents in order to arrive at equitable termination costs;

(2) In the event of a disagreement between the Contractor and the District over the amount due the Contractor under the terms of the Contract;

(3) To check or substantiate any amounts invoiced or paid which are required to reflect the costs of the Contractor, or the Contractor's efficiency or effectiveness under this Contract or in connection with extras, changes, claims, additions, backcharges, or others, as may be provided for in this Contract;

(4) If it becomes necessary to determine the District's rights and the Contractor's obligations under the Contract or to ascertain facts relative to any claim against the Contractor which may result in a charge against the District;

(5) To determine any difference in cost occasioned by a permissible substitution;

(6) And/or for any other reason in the District's sole judgment.

(b) Contractor shall provide the District (or its representatives), unlimited, reasonable access during working hours to the Contractor's books and records. The District's audit rights shall be liberally construed in the District's favor.

(c) The Contractor, from the effective date of final payment or termination hereunder, shall preserve and make available to the District for a period of three (3) years thereafter, at all reasonable times at the office of the Contractor (but without any charge to the District), all its books, records, documents, photographs, micro-

photographs, and other evidence bearing on the costs and expenses of the Contractor under this Contract and relating to the Work hereunder.

(d) The District will make all payments required of it under this Contract subject to audit, under circumstances stated above, which audit may be performed at the District's option, either during the Contract time period or during the record retention time period. Regardless of authorization, approval or acceptance, signatures or letters which are given by the District and are part of the District's control systems or are requested by the Contractor, the payments made under this Contract shall not constitute a waiver or agreement by the District that it accepts as correct the billings, invoices or other charges on which the payments are based. If the District's audit produces a claim against the Contractor, the District may pursue all its legal remedies even though it has made all or part of the payments required by this Contract.

(e) If any audit by the District or its representative discloses an underpayment by the District pursuant to the terms of the Contract Documents, the District shall have the duty to pay any amount found by the audit to be owed to the Contractor. If such audit discloses an overpayment, the Contractor shall have the obligation to reimburse the District for the amount of the overpayment. The District's right to claim reimbursement from the Contractor of any overpayment shall not be terminated or waived until three years after the completion of the District's audit or upon the termination of audit rights under subparagraph 3.18(f), whichever date is later. The obligation of the Contractor to make reimbursements hereunder shall not terminate except as provided by law.

(f) The District's right to audit and the preservation of records shall terminate at the end of three (3) years after the date final payment is made or termination of the Contract. The Contractor shall include this "Right to Audit and Preservation of Records" clause in all subcontracts issued by it and it shall require the same to be inserted by all lower tier Subcontractors in their subcontracts, for any portion of the work. Should Contractor fail to include this clause in any such contract or lower tier contract, or otherwise fail to insure the District's rights hereunder, Contractor shall be liable to the District for all costs, expenses and attorney's fees which the District may have to incur obtaining or attempting to obtain an audit or inspection of or the restoration of records which otherwise would have been available to the District from said persons under this clause. Such audit may be conducted by the District or its authorized representative.

SECTION 4

CONTROL OF MATERIALS

4.01. MATERIALS

(a) Unless otherwise specifically stated in the Specifications, the Contractor shall furnish all materials necessary for the execution and completion of the Work. Unless otherwise specified, all materials shall be new and shall be manufactured, handled, and installed in a workmanlike manner to insure completion of the Work in accordance with the Contract Documents. The Contractor shall, upon request of the Architect or District Representative, furnish satisfactory evidence as to the kind and quality of materials.

(b) Where materials are to be furnished by the District, the type, size, quantity and location at which they are available will be stated in the Contract Documents.

(c) Manufacturers' warranties, guarantees, instruction sheets and parts listed, which are furnished with certain articles or materials incorporated in the Work, shall be delivered to the Engineer before acceptance of the Contract.

4.02. STORAGE OF MATERIALS

Articles or materials to be incorporated in the Work shall be stored in such a manner as to insure the preservation of their quality and fitness for the Work, and to facilitate inspection.

4.03. TRADE NAMES AND ALTERNATIVES

Whenever a material, article, system or sub-system is specified or described by using the name and/or model of a proprietary product or trademark or the name of the manufacturer or vendor, the specified item shall establish the type, function, and quality required. It shall be understood that the words "or approved equivalent" are implied whether or not they follow the proprietary enumeration.

The District reserves the right to determine when proprietary items have no equivalency, and when uniformity of operations, interchangeability of parts, standard parts inventory, etc., are in the District's best interest.

Requests for review of equivalency will be considered upon submission of sufficient information as described herein, to allow complete review. Such requests shall not be accepted from anyone other than the Contractor. Such submission must be made prior to purchase, fabrication, manufacture or use of the equivalent items under consideration.

(a) Contractor's Risk. If the Contractor includes in its Proposal or later proposes any material, product or equipment that the Contractor considers equivalent to that specified, the Contractor assumes all risk of any sort associated with acceptance or rejection of proposed equivalent items. The Contractor shall have no right to make claim based upon Contractor's Proposal that includes a proposed equivalent item(s) of work which resulted in a lower Proposal amount for said item(s) or lower total Proposal.

(b) Submission Requirements. Each submission for equivalency review shall include:

(1) Justification for use of the proposed equivalent item(s), including evidence, as applicable, that Contract specified material, product or equipment is unobtainable or unobtainable within an acceptable time for contract completion;

(2) A description of the difference between specified item(s) and proposed equivalent item(s) and the comparative advantages and disadvantages of each;

(3) All relevant data addressing each specified parameter to show equivalency;

(4) A prediction of any effects the proposed change will have on operation and maintenance costs where applicable.

(5) Equivalency. An item will be considered equivalent to the item specified if it is equal to or better in:

(6) Design and strength in all sub-parts, quality, reliability and durability, operation, maintenance and serviceability, as applicable; and

(7) Specified parameters in performance in all respects for the specific function(s) indicated in the contract.

(c) Supplemental Requirements. Any tests required by the District to establish quality and performance standards shall be promptly conducted by or through the Contractor at no additional cost to the District. In addition, the Contractor shall:

(1) Submit any additional data requested by the District or District Representative for the equivalency review; and

(2) Satisfactorily accomplish all changes, including any Engineering associated with use of equivalent items, at no additional cost to the District.

(d) Equivalency Determinations. The District or District Representative shall be the sole judge as to equivalency determinations. The District or District Representative's decision shall be final. The Contractor shall have no right of appeal to any decision rejecting the equivalency of any item.

(e) Procedure.

(1) Data substantiating a request for a substitution of "an equal" item shall be submitted prior to the Award of the Contract pursuant to Section 3400 of the latest edition of the Public Contract Code.

(2) After the Proposal opening, the Proposers shall have seven (7) calendar days to provide complete substantiating data for all product, material or system substitution requests. After this seven (7)-day period, the District

may award the Contract. In no event will product, material or system substitution requests submitted after the Award of Contract be considered. Failure to submit such substantiating data will result in the automatic rejection of the proposed substitution request. The District will have fifteen (15) days to review the first ten (10) proposed substitution requests. For each additional five (5) product, material or system substitution requests over and above the initial ten (10), the District will have ten (10) additional days to review the proposed substitution requests.

(3) Each substitution request may include one alternate substitution. All alternate substitutions shall be submitted concurrently with substitution requests. Upon review by the District, proposed substitutions shall be returned to the Proposer marked either “accepted” or “rejected”. The District shall only review alternative substitution requests if the primary substitution request is rejected. If a substitution request, and its alternative, is returned “rejected”, no further substitution requests for that product, material or system will be allowed and the Proposer will provide the specified product, material or system.

(4) The District may award the Contract at any time after the time for submitting substitution requests expires pursuant to subpart (2), above. In the event the Contract is awarded prior to acceptance/rejection of substitution requests, all outstanding substitution requests shall be reviewed by the District as provided above. If the successful Proposer elects not to execute the Contract, the Award of Contract shall be rescinded and the Contract awarded to another Proposer in the discretion of the District. All Proposers electing not to execute the Contract expressly agree that the District shall incur no liability for such rescissions.

4.04. CERTIFICATES OF COMPLIANCE

(a) A Certificate of Compliance shall be furnished prior to the use of any materials for which the Technical Specifications require that such a certificate be furnished. In addition, when so authorized in the Specifications, the Architect or District Representative may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance. The Certificate of Compliance shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the Contract. A Certificate of Compliance shall be furnished with each lot of material delivered to the Work and the lot so certified shall be clearly identified in the Certificate.

(b) All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the Work which conforms to the requirements of the Contract Documents and any such material not conforming to such requirements will be subject to rejection whether in place or not.

(c) The District reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance. The form of the Certificate of Compliance and its disposition shall be as directed by the Architect or District Representative.

SECTION 5

LEGAL RELATIONS AND RESPONSIBILITY

5.01. COMPLIANCE WITH LAWS – PERMITS, REGULATIONS, TAXES

The Contractor is an independent contractor and shall, at the Contractor's sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the Work, obtain all necessary permits and licenses therefore, pay all manufacturers' taxes, sales taxes, use taxes, processing taxes, and all federal and state taxes, insurance and contributions for social security and unemployment which are measured by wages, salaries or any remuneration paid to Contractor's employees, whether levied under existing or subsequently enacted laws, rules or regulations. The Contractor shall also pay all property tax assessments on materials or equipment used until acceptance by the District. If any discrepancy or inconsistency is discovered in the Plans or Specifications, or in this Contract in relation to any such law, rule, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the District Representative in writing. The Contractor shall also protect, defend and indemnify the District, District Representative the Architect, and all of the District's officers, agents, and servants against any claim or liability arising from or based upon the violation of any such law, rule, ordinance, regulation, order or decree, whether by the Contractor or its employees. Particular attention is called to the following:

(a) Without limitation, materials furnished and performance by Contractor hereunder shall comply with Safety Orders of the Division of Industrial Safety, State of California, Federal Safety regulations of the Bureau of Labor, Department of Labor; and any other applicable Federal regulations.

(b) The Contractor, upon request shall furnish evidence satisfactory to the District and Architect that any or all of the foregoing obligations have been or are being fulfilled. The Contractor warrants to the District that it is licensed by all applicable governmental bodies to perform this Contract and will remain so licensed throughout the progress of the Work, and that Contractor has, and will have, throughout the progress of the Work, the necessary experience, skill and financial resources to enable the Contractor to perform this Contract.

(c) Contractor is required to insure that material safety data sheets (MSDS's) for any material requiring a material safety data sheet pursuant to any federal or state law are available in a readily accessible place on the Project premises. Contractor is also required to insure:

(1) The proper labeling of any substance brought onto the Project premise by Contractor or any subcontractors and

(2) That the person(s) working with the material, or within the general area of the material, are appropriately informed about the hazards of the substance and follow proper handling and protection procedures.

(d) Contractor is required to comply with the provisions of California Health and Safety Code section 25249.5, et seq. (Prop. 65), which requires the posting and giving of notice to persons who may be exposed to any chemical known to the State of California to cause cancer.

(e) On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (EO) regarding sanctions in response to Russian aggression in Ukraine. The EO is located at https://www.gov.ca.gov/wp-content/uploads/2022/03/3.4.22-Russia-Ukraine-Executive-Order.pdf.

Under the EO, compliance is required with all economic sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. To the fullest extent under the law, the District will engage all measures to comply with the sanctions and the EO, including:

-Refraining from entering into new contracts with prohibited individuals or entities while the sanctions are in effect;

-Desisting from making new investments in, or engaging in financial transactions with, Russian entities, and from transferring technology to Russia or Russian entities; and

-Endeavoring to support the government, people, and businesses of Ukraine where possible.

As a District contractor, compliance with the economic sanctions imposed in response to Russia's actions in Ukraine is required, including with respect to, but not limited to, the federal executive orders identified in the EO and the sanctions identified on the U.S. Department of the Treasury website (https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information/ukraine-russia-related-sanctions). Failure to comply may result in the termination of the subject contract or grant, as applicable.

5.02. PREVAILING WAGE

(a) The Contractor shall forfeit as penalty to the District the amount specified by law for each calendar day or portion thereof for each worker (whether employed by the Contractor or any Subcontractor) paid less than the stipulated prevailing rates for any work done under the Contract in violation of the provisions of the Labor Code and in particular, Section 1775 which is incorporated herein by reference.

(b) The District will not recognize any claims for additional compensation because of the payment of the wages set forth in these General Conditions. The possibility of wage increases is one of the elements to be considered by the Contractor in determining its proposal, and will not under any circumstances, other than delays caused by the District, the Architect, or the District's agents, be considered as the basis of a claim against the District.

(c) The Contractor agrees to follow the instructions of the District's labor compliance officer until notified otherwise in writing by the District.

(d) The Director of the Department of Industrial Relations of the State of California has determined the general prevailing rate of wages of per diem wages in the locality in which the work is to be performed for each craft or type of worker needed to execute the Contract. Copies of the applicable prevailing wage rate determinations are made available to the Contractor and Subcontractor at the Pre-Job Conference Meeting. The Contractor shall post a copy of this document at the prevailing wages

at each job site, along with a CMU work place poster (available from the Department of Industrial Relations), printed on 8 1/2" X 11" paper or larger, in accordance with California Code of Regulations, Title 8, section 16451(d).

5.03. PREVAILING WAGE RECORDS

(a) The Work is subject to monitoring and enforcement of prevailing wage requirements by the Department of Industrial Relations ("DIR") and the following provisions will apply:

(1) Contractor and subcontractors shall maintain and furnish to the DIR, a certified copy of each weekly payroll (but no less often than monthly), with a statement of compliance signed under penalty of perjury. Such certified payroll reports in PDF form shall be transmitted electronically to the DIR. The provisions of Labor Code section 1776 are incorporated herein by reference.

(2) The District and the DIR shall review, including by way of job site inspections, and, if appropriate, audit payroll records to verify compliance with the public works requirements of the Labor Code. The DIR will notify the Contractor or Subcontractor(s), as appropriate) of any noncompliance, in order for all such Contractor or Subcontractor(s) to correct the noncompliance.

(3) The District shall withhold payments when payroll records are delinquent or inadequate.

(4) The District shall withhold payments equal to the amount of underpayment and applicable penalties when, after investigation, it is established that underpayment has occurred.

(5) The District shall cooperate with the DIR and DLSE in any investigation of suspected violations of prevailing wage requirements.

(6) As directed by the Labor Commissioner, the District shall withhold Contract payments equal to the payments due or estimated to be due to the Contractor or Subcontractors whose payroll records are delinquent or inadequate, plus any additional amount that the Labor Commissioner has reasonable cause to believe may be needed to cover a back wage and penalty assessment against such Contractor or Subcontractors. The Contractor shall be required to withhold payments to a Subcontractor whose payroll records are delinquent or inadequate until the Labor Commissioner provides notice that the Subcontractor has cured such delinquency or deficiency.

(7) These payroll records shall be made available to the District's representatives. These records shall be maintained during the course of the Work. The Contractor and all subcontractors shall make the certified payroll records available for inspection by District representatives upon request and shall permit such representatives to interview employees during the work hours on the job site.

(8) The Contractor shall be held entirely responsible for the prompt resolution of all non-compliances with the prevailing wage laws, including those pertaining to all subcontractors and any lower tier subcontractors.

(9) The Project will not be accepted as complete by the District nor final payment made until all items of non-compliance are corrected or until appropriate provision is made by depository agreement to assure the ultimate resolution and payment of any back wages that may be found due.

(b) A pre-construction conference shall be conducted before commencement of the Work with the Contractor and subcontractors at which time the prevailing wage requirements will be reviewed and agreed to by all parties.

5.04. LABOR DISCRIMINATION

Attention is directed to Section 1735 of the Labor Code, which reads as follows: “A contractor shall not discriminate in the employment of persons upon public works on any basis listed in subdivision (a) of Section 12940 of the Government Code, as those bases are defined in Sections 12926 and 12926.1 of the Government Code, except as otherwise provided in Section 12940 of the Government Code. Every contractor for public works who violates this section is subject to all the penalties imposed for a violation of this chapter."

5.05. EIGHT-HOUR DAY LIMITATION

(a) In accordance with the provisions of the Labor Code, and in particular, Sections 1810 to 1815 thereof, inclusive, eight hours labor shall constitute a day’s work, and no worker, in the employ of said Contractor, or any Subcontractor, doing or contracting to do any part of the work contemplated by this Contract, shall be required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of those provisions; provided that subject to Labor Code section 1815, a worker may perform work in excess of either eight (8) hours per day or forty (40) hours during any one week upon compensation for all hours worked in excess of eight (8) hours per day or forty (40) hours during any one week at not less than one and one-half times the basic rate of pay.

(b) The Contractor and each Subcontractor shall also keep an accurate record showing the names and actual hours worked of all workers employed by them in connection with the Work. This record shall be open at all reasonable hours to the inspection of the District, State and Federal officers and agents. It is hereby further agreed that, the Contractor shall forfeit as a penalty to the District the sum of twenty-five dollars ($25) for each worker employed in the performance of this Contract by the Contractor or by any of its Subcontractors for each calendar day during which such worker is required or permitted to labor more than eight (8) hours in and one calendar day and forty (40) hours in any one calendar week in violation of Sections 1810 through 1815.

5.06. COMPLIANCE WITH STATE REQUIREMENTS FOR EMPLOYMENT OF APPRENTICES

The Contractor’s attention is directed to Section 1777.5 of the Labor Code. Provisions of said section pertaining to employment of registered apprentices are hereby incorporated by

reference into these Specifications. As applicable, the Contractor or any Subcontractor employed by the Contractor in the performance of the Work shall take such actions as necessary to comply with the provisions of Section 1777.5.

5.07. UNDERGROUND UTILITIES

(a) In accordance with Government Code section 4215, the Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating existing main or trunkline utility facilities which are not indicated in the Contract Plans and Specifications with reasonable accuracy, and for the equipment on the Project necessarily idled during such work, provided that the Contractor shall first notify the District's Representative before commencing work on locating, repairing damage to, removing or relocating such utilities. Contractor shall not be assessed liquidated damages for delays in completing the Work when such delays are due to the failure of either the District or the owner of the utility to provide for removal or relocation of such utility facilities.

(b) The Contractor shall take all precautions necessary to protect the existing utilities within the project area. Any utilities damaged due to the Contractor's negligence shall be repaired or restored to their original condition at the Contractor's sole expense. Existing utilities shall be kept in service during the life of the Contract unless relocation, reconstruction, abandonment, or outage is specifically authorized by the District's Representative.

(c) The Contractor shall provide and maintain such temporary supports as may be necessary to preserve the functions of the various utility systems. No wires, conduits and/or pipes shall be removed until all services therein have been made inoperable.

(d) The Contractor shall notify the District's Representative and appropriate Regional Notification Center for operators of subsurface installations at least two (2) working days, but not more than fourteen (14) calendar days, prior to performing excavation or other work close to any underground pipeline, conduit, duct, wire and other structures. The Contractor shall provide updated information to the Notification Center as required and on a periodic basis. The Regional Notification Center includes but is not limited to the Underground Service Alert-Southern California (USA) at 1-800-422-4133.

(e) The Contractor is advised that the State of California does not participate in USA. The Contractor is required to notify CalTrans Permits Branch (916) 322-1297 for the location of State facilities.

(f) The Contractor shall not proceed with work until utility facilities involved have been located, disconnected, or otherwise adjusted by utility representatives.

(g) The District Utility Maintenance Division will make repairs to all water service laterals and water mains damaged by the Contractor during the course of construction unless directed otherwise by the Engineer. Except as otherwise provided in this section, the Contractor shall be required to pay all labor, material and equipment costs incurred by the District Utilities Maintenance Division for the repairs made to damaged water service laterals and water mains. The District will bill the Contractor

for the repairs and the bills will be paid by the Contractor prior to either the next monthly progress payment or prior to the final payment, whichever comes first. The Contractor shall provide to the Engineer proof of payment of the repair bills prior to the issuance of either the monthly progress payment or final payment. The current labor and equipment rates for the District Utility Maintenance Division will be made available to the Contractor at the preconstruction conference. The District shall have the right to deduct the total amount of any unpaid District repair bill from the money due or to become due the Contractor.

5.08. WATER POLLUTION

The Contractor shall exercise every reasonable precaution to protect streams, lakes, reservoirs, and canals from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials and shall conduct and schedule Contractor's operations so as to avoid or minimize muddying and silting of said streams, lakes, reservoirs, and canals. Care shall be exercised to preserve vegetation beyond the limits of construction. The Contractor shall comply with Section 5650 of the California Fish and Game Code and all other applicable statutes and regulations relating to the prevention and abatement of water pollution.

5.09. PAYMENT OF TAXES

The Contract prices paid for the Work shall include full compensation for all taxes, which the Contractor is required to pay, whether imposed by federal, state, or local governments.

5.10. PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, and give all notices necessary and incident to the lawful prosecution of the work. All permits and licenses shall be obtained in sufficient time to prevent delays to the Work. The Contractor shall, at a minimum, possess and maintain the licenses and permits set forth in the Contract Provisions.

5.11. PATENTS

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated into the Work, and agrees to indemnify, defend and save harmless the District, the Engineer, and their duly authorized representatives, from all suits at law, or actions of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

5.12. PUBLIC CONVENIENCE

This section defines the Contractor’s responsibility with regard to convenience of the public and public traffic in connection with its operations.

(a) The Contractor shall so conduct its operations as to offer the least possible obstruction and inconvenience to the public. The Contractor shall have under construction no greater length or amount of work than can be properly prosecuted with due regard to the rights of the public.

(b) Unless otherwise provided in the Contract Documents, all public traffic shall be permitted to pass through the Work with as little inconvenience and delay as possible. In order to expedite the passage of public traffic through or around the work, the Contractor shall install as appropriate signs, lights, flares, barricades, and other

facilities for the sole convenience and direction of public traffic. Also, where directed by the Engineer, the Contractor shall provide and station competent flagpersons whose sole duties shall consist of directing the movement of public traffic through or around the Work. The cost of furnishing and installing such signs, lights, flares, barricades, and other facilities, and the cost of providing and stationing such flagpersons, all for the convenience and direction of public traffic, will be considered as included in the Contract price and no additional compensation will be allowed.

(c) Spillage resulting from hauling operations along or across any publicly traveled way shall be removed immediately by the Contractor at its expense.

(d) Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

(e) Convenient access to driveways, houses and buildings along the line of the work shall be maintained and temporary approaches to crossings or intersecting highways shall be provided and kept in good condition. When the abutting property owner's access across the right-of-way line is to be eliminated, or to be replaced under the Contract by other access facilities, the existing access shall not be closed until the replacement access facilities are usable.

(f) Contractor shall supply water for the alleviation or prevention of dust nuisance as provided in the Contract Documents.

(g) Flagpersons and guards, while assigned to traffic control, shall perform their duties and shall be provided with the necessary equipment in accordance with the current "Instructions to Flagmen" of the California Department of Transportation. The equipment shall be furnished and kept clean and in good repair by the Contractor at its expense.

(h) All traffic control shall be in accordance with California Manual on Uniform Traffic Control Devices (California MUTCD), Part 6 and this Section 5.12.

(1) Traffic Control Plans

Traffic Control Plans shall be developed for the project to assure that adequate consideration is given to the safety and convenience of motorists, pedestrians, and workers during construction. The Traffic Control Plans shall include, but not be limited to, signing, pavement markings, construction scheduling, permanent barricades, methods and devices for delineation and channelization, placement and maintenance of devices, roadway lighting, traffic regulations, surveillance and inspection. The Traffic Control Plans shall be approved by the Engineer a minimum of two (2) working days prior to start of any work. Non-compliance with any stipulation of this section will be justification for the District to stop work.

(2) Traffic Control Devices and Procedures

Traffic control devices and procedures shall conform to the California Manual on Uniform Traffic Control Devices (California MUTCD), Part 6 and this Section 5.12. Non-compliance with any stipulation of this section will be justification for the District to stop work.

(3) Measurement and Payment

Unless specifically shown as an item of work on the proposal form, all traffic control shall be considered included in other items of work and no additional compensation will be made for labor, materials or equipment needed.

5.13. CONTINUOUS OPERABILITY OF FACILITIES

Absent written permission by the District, the continuous operation of all existing facilities is required and shall in no way be affected by the Work.

5.14. SAFETY

(a) General

(1) The Contractor shall be solely and completely responsible for the conditions of the job Site, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable federal, state, and local laws, ordinances, and codes, and to the rules and regulations established by the California Division of Industrial Safety, and to other rules of law applicable to the Work.

(2) The services of the District's Representative or Architect in conducting construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing or scaffolding or safety measures, in, on, or near the construction site, and shall not be construed as supervision of the actual construction nor make the District's Representative, Architect or the District responsible for providing a safe place for the performance of work by the Contractor, Subcontractors, or suppliers; or for access, visits, use work, travel or occupancy by any person.

(3) The Contractor shall carefully instruct all personnel working in potentially hazardous work areas as to potential dangers and shall provide such necessary safety equipment and instruction as is necessary to prevent injury to personnel and damage to property. Special care shall be exercised relative to electrical work, work involving excavation and in sump pump work.

(4) All work and materials shall be in strict accordance with all applicable State, Federal and local laws, rules, regulations, and codes.

(5) Nothing in this Contract is to be construed to permit work not conforming to governing law. When Contract Documents differ from governing law, the Contractor shall furnish and install the higher standards called for without extra charge. All equipment furnished shall be grounded and provided with guards and protection as required by safety codes. Where vapor-tight or explosion-proof electrical installation is required by law, this shall be provided.

(6) The Contractor shall submit a safety plan and/or narrative description to the District's Representative prior to commencement of the Work. This safety plan and/or narrative description shall describe all first aid, safety clothing, etc. to be used at the Project Site.

(b) Shoring and Trench Safety Plan

(1) Attention is directed to Section 832 of the Civil Code of the State of California relating to lateral and subjacent support, and the Contractor shall comply with this law.

(2) In accordance with Section 6705 of the State Labor Code, the Contractor shall submit to the District specific plans to show details of provisions for worker protection from caving ground. Not less than thirty (30) days before beginning excavation for any trench or trenches five feet or more in depth required under this Contract, the Contractor shall furnish to the District's Representative working drawings of its trench safety plan. The trench safety plan working drawings shall be detailed plans showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. If such plan varies from the shoring system standards established by the Construction Safety Orders of the California Division of Industrial Safety or the Federal Safety and Health Regulations for Construction of the Occupational Safety and Health Administration, Department of Labor, the plan shall be prepared by a registered civil or structural engineer. In no event shall the Contractor use a shoring, sloping, or protective system less effective than that required by said Construction Safety Orders, or less effective than that required by said Federal Safety Standards. Submission of this plan in no way relieves the Contractor from the requirement to maintain safety in all operations performed by the Contractor or its Subcontractors.

5.15. BLASTING

Except for exceptional circumstances, blasting shall be prohibited. Accordingly, Proposals should be prepared on the basis that no blasting will be permitted. Should blasting be required and expressly approved by the District, the District will issue a Change Order for blasting work.

5.16. INTOXICATING LIQUORS AND NARCOTICS

The Contractor shall not sell, permit or suffer the introduction or use of intoxicating liquors or narcotics upon or about the Site.

5.17. PROTECTION OF PERSONS AND PROPERTY

(a) The Contractor shall take whatever precautions are necessary to prevent damage to all existing improvements, including above ground and underground utilities, trees, shrubbery that is not specifically shown to be removed, fences, signs, mailboxes, survey markers and monuments, buildings, structures, the District's property, adjacent property, and any other improvements or facilities within or adjacent to the work. If such improvements or property are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored, at the

Contractor's expense, to a condition at least as good as the condition they were in prior to the start of the Contractor's operations.

(b) The Contractor shall adopt all practical means to minimize interference to traffic and public inconvenience, discomfort or damage. The Contractor shall protect against injury to any pipes, conduits or other structures crossing the trenching or encountered in the Work and shall be responsible for any injury done to such pipes or structures, or damage to property resulting therefrom. The Contractor shall support or replace any such structures without delay and without any additional compensation to the entire satisfaction of the District. All obstructions to traffic shall be guarded by barriers illuminated at night. The Contractor shall be responsible for all damage to persons and property directly or indirectly caused by its operations and, under all circumstances, Contractor must comply with the laws and regulations of the State of California relative to safety of persons and property and the interruption of traffic and the convenience of the public within the respective jurisdictions.

(c) The Contractor is cautioned that it must replace all improvements in rights-of- way and within the public streets to a condition at least equal to what existed prior to the Contractor's entry onto the job.

(d) Type and time of construction required at any road subject to interference by the work will be determined by those authorities responsible for maintenance of said road. It shall be the responsibility of the Contractor to determine the nature and extent of all such requirements, including provision of temporary detours as required; however, the construction right-of-way obtained by the District at affected roadways will be adequate for provision of all required detours. As required at any road crossing, the Contractor shall provide all necessary flagpersons, guardrails, barricades, signals, warning signs and lighting to provide for the safety of existing roads and detours. Immediately after the need for temporary detours ceases, or when directed, the Contractor shall remove such detours and perform all necessary cleanup work, including replacement of fences, and removal of pavement. Included shall be all necessary replacement of existing roadway appurtenances, grading work, soil stabilization and dust control measures, as required and directed.

(e) The Contractor shall examine all bridges, culverts, and other structures over which it will move its materials and equipment, and before using them, Contractor shall properly strengthen such structures where necessary. The Contractor shall be responsible for any and all injury or damage to such structures caused by reason of its operations.

5.18. RESPONSIBILITY FOR REPAIR OF FACILITIES

All public or private facilities, including but not limited to, gravel surfacing at existing canals, structures, telephone cables, roadways, curbs, gutters, parking lots, private drives, levees and embankments for creeks, ponds and reservoirs disturbed during construction of the work shall be repaired and/or replaced by the Contractor to match facilities existing prior to construction. In addition, the Contractor shall be responsible for any settlement damage to such facilities or adjoining areas for a period of one year after acceptance of such required facilities.

5.19. DISTRICT'S REPAIR

In the event the Contractor refuses or neglects to make good any loss or damage for which it is responsible under this Contract, the District may itself or by the employment of others, make good any such loss or damage, and the cost and expense of doing so, including any reasonable engineering, legal and other consultant fees, and any costs of administrative and managerial services, shall be charged to the Contractor. Such costs and expenses may be deducted by the District from claims for payment made by the Contractor for work completed or remaining to be completed.

5.20. ANTITRUST CLAIM ASSIGNMENT

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to this contract, the Contractor and all subcontractors shall offer and agree to assign to the District all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or subcontract. This assignment shall be made and become effective at the time the District tenders final payment to the Contractor, without further acknowledgement by the parties.

5.21. WAIVER OF RIGHT TO RESCIND FOR MATERIAL BREACH

The Contractor agrees that it can be adequately compensated by money damages for any breach of this Contract which may be committed by the District and hereby agrees that no default, act, or omission of the District or the Engineer, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of this Contract or (unless the District shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. The Contractor hereby waives any and all rights and remedies to which it might otherwise be or become entitled, save only its right to money damages.

5.22. CONTRACTOR'S LICENSE NOTICE

CONTRACTORS ARE REQUIRED BY LAW TO BE LICENSED AND REGULATED BY THE CONTRACTORS' STATE LICENSE BOARD. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO:

REGISTRAR CONTRACTORS' STATE LICENSE BOARD
9821 BUSINESS PARK DRIVE
SACRAMENTO, CALIFORNIA 95827
MAILING ADDRESS: P.O. BOX 26000
SACRAMENTO, CALIFORNIA 95826

5.23. HISTORICAL, SCIENTIFIC AND ARCHEOLOGICAL DISCOVERIES

All articles of historical or scientific value, including but not limited to coins, fossils, and articles of antiquity which may be uncovered by the Contractor during the progress of work, shall become District property. Such findings shall be reported immediately to the District's Representative who will determine the method of removal, where necessary, and the final disposition thereof.

5.24. INSURANCE

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property, which may arise from or in connection with the performance of the Work hereunder by the Contractor, its agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Contractor's Proposal.

(a) Neither the Contractor nor any Subcontractors shall commence any work until all required insurance has been obtained at their own expense. Such insurance must have the approval of the District as to limit, form, and amount, and shall be placed with insurers with a current A. M. Best's rating of no less than A-VII.

(b) Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guarantee period.

(c) Prior to execution of the Contract, the Contractor shall furnish the District with original endorsements effecting coverage for all policies required by the Contract. The endorsements shall be signed by a person authorized by the insurer to bind coverage on its behalf. The endorsements are to be on forms provided or approved by the District. The District may require the Contractor or any subcontractor to furnish complete certified copies of all insurance policies affecting the coverage required by the Contract.

(d) All of the Contractor's policies shall contain an endorsement providing that written notice shall be given to the District at least sixty (60) calendar days prior to termination, cancellation, or reduction of coverage in the policy.

(e) Any policy or policies of insurance that the Contractor elects to carry as insurance against loss or damage to its construction equipment and tools shall include a provision therein providing a waiver of the insurer's right to subrogation against the District and the Engineer.

(f) The requirements as to the types, limits, and the District's approval of insurance coverage to be maintained by the Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under the Contract.

(g) In addition to any other remedy the District may have, if the Contractor or any of the subcontractors fails to maintain the insurance coverage as required in this section, the District may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as required herein, and the District may deduct the cost of such insurance from any amounts due or which may become due the Contractor under this Contract.

(h) The Contractor and all Subcontractors shall, at their expense, maintain in effect at all times during the performance of work under the Contract not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the District. The maintenance by the Contractor and all Subcontractors of the following coverage and limits of insurance is a material element of this Contract. The failure of the Contractor or any Subcontractor

to maintain or renew coverage or to provide evidence of renewal may be treated by the District as a material breach of this contract.

(1) Workers' Compensation and Employer's Liability Insurance

(i) Workers' Compensation

The Contractor and all Subcontractors shall maintain insurance to protect the Contractor or subcontractor from all claims under Workers' Compensation and Employer's Liability Acts, including Longshoremen's and Harbor Workers' Act. Such coverage shall be maintained, in type and amount, in strict compliance with all applicable State and Federal statutes and regulations. The Contractor shall execute a certificate in compliance with Labor Code section 1861, on the form provided in the Contract Documents.

(ii) Claims Against District

If an injury occurs to any employee of the Contractor or any of the Subcontractors for which the employee or its dependents, in the event of its death, may be entitled to compensation from the District under the provisions of the said Acts, or for which compensation is claimed from the District, there will be retained out of the sums due the Contractor under this Contract, an amount sufficient to cover such compensation as fixed by said Acts, until such compensation is paid or it is determined that no compensation is due. If the District is required to pay such compensation, the amount so paid will be deducted and retained from such sums due, or to become due, the Contractor.

(2) Commercial General, Excess and Automobile Liability Insurance

The Contractor shall maintain in effect at all times during the performance of the work hereunder not less than the following coverage's and limits of Commercial General, Excess and Automobile Liability insurance:

(i) Form and Amount

The insurance shall include, but shall not be limited to, protection against claims arising from death, bodily injury, personal injury, or damage to property resulting from actions, failures to act, operations or equipment of the insured, or by its employees, agents or consultants, or by anyone directly or indirectly employed by the insured. The amount of insurance coverage shall not be less than $2,000,000 per occurrence with an aggregate no less than two (2) times the required per occurrence limit applying to bodily injury, personal injury, and property damage, or any combination of the three. The amount of excess insurance coverage shall not be less than $5,000,000 per occurrence. Any deductibles must be declared to and approved by the District. At the option of the District, either: the insurer shall

reduce or eliminate such deductibles as respects the entity, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration expenses, and defense expenses.

The commercial general, excess and automobile liability insurance coverage shall also include the following:

(ii) Additional Requirements

Provision or endorsement naming the District, the District's Representative, Architect and its consultants, and each of their officers, employees, and agents, each as additional insured's with respect to any potential liability arising out of the performance of any work under the Contract, and providing that such insurance is primary insurance as respects the interest of the District the District's Representative, Architect, and its consultants, and each of their officers, employees, and agents and that any other insurance, risk pool membership, or other liability protection maintained by the District or maintained by the Architect is excess to the insurance required hereunder, and will not be called upon to contribute to any loss unless and until all limits available under the contractor's and subcontractor's insurance policy/policies have been paid. The additional insured coverage under the Contractor's policy shall be "primary and non-contributory" and will not seek contribution from the District's insurance or self-insurance and shall be at least as broad as CG 20 01 04 13.

(iii) "Cross Liability" or "Severability of Interest" clause.

(iv) Broad Form Property Damage, Personal Injury, Contractual Liability, Protective Liability, and Completed Operations coverage's, and elimination of any exclusion regarding loss or damage to property caused by explosion or resulting from collapse of buildings or structures or damage to property underground, commonly referred to by insurers as the "XCU" hazards.

(v) Provision or endorsement stating that such insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Contractor under the Contract, including, without limitation, that set forth in Section 5.25, Indemnity and Litigation Costs.

(vi) Provision or endorsement stating that any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the District, its officers, officials, employees, or volunteers.

(vii) The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(3) Builder's Risk or Installation Floater "All-Risk" Insurance

Before commencement of the Work, the Contractor shall submit written evidence that it has obtained for the period of the Contract, Builder's Risk "All-Risk" Completed Value Insurance and/or Inland Marine "All-Risk" Installation Floater Insurance, as may be applicable, upon the entire project which is the subject of this Contract, including completed work and work in progress. The policy or policies of insurance shall name the Contractor, District, and Engineer as insured's as their respective interests may appear, and shall include an insurer's waiver of subrogation rights in favor of each. Such insurance may have a deductible clause, but the amount of the deductible shall be subject to the approval of the District, except that the deductible on earthquake coverage may be in accordance with the underwriter's requirements.

5.25. INDEMNITY AND LITIGATION COST

(a) Promptly upon execution of the Contract, the Contractor specifically obligates itself and hereby agrees to protect, hold free and harmless, defend (with counsel selected by the District) and indemnify the District, the District's Representative, Architect and its consultants, and each of their officers, employees and agents, from any and all liability, penalties, costs, losses, damages, expenses, causes of action, claims or judgments, including attorney's fees, which arise out of or are in any way connected with the Contractor's, or its subcontractors' or suppliers', performance of work under this Contract or failure to comply with any of the obligations contained in the Contract. This indemnity shall imply no reciprocal right of the Contractor in any action on the contract pursuant to California Civil Code section 1717 or section 1717.5. To the fullest extent legally permissible, this indemnity, defense and hold harmless agreement by the Contractor shall apply to any and all acts or omissions, whether active or passive, on the part of the Contractor or its agents, employees, representatives, or Subcontractor's agents, employees and representatives, resulting in claim or liability, irrespective of whether or not any acts or omissions of the parties to be indemnified hereunder may also have been a contributing factor to the liability, except such loss or damage which was caused by the active negligence, the sole negligence, or the willful misconduct of the District.

(b) In any and all claims against the District, the District's Representative, Architect and each of their consultants, officers, employees and agents by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this section shall not be limited in way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Workers' Compensation statutes, disability benefit statutes or other employee benefit statutes.

5.26. PROTECTION OF WORK

(a) The Contractor shall be responsible for the care of all the Work until its completion and final acceptance. The Contractor shall, at its own expense, replace damaged or lost material and repair damaged parts of the Work or the same may be done at the Contractor's expense by the District and the Contractor and its sureties shall be liable therefor. The Contractor shall make its own provisions for properly storing and protecting all material and equipment against theft, injury, or damage from any and all causes. Damaged material and equipment shall not be used in the Work.

The Contractor shall take all risks from floods and casualties except as provided by law, and shall make no charge for the restoration of such portions of the work as may be destroyed or damaged by flood or other casualties or because of danger from flood or other casualties or for delays from such causes. The Contractor may, however, be allowed a reasonable extension of time on account of such delays, subject to the conditions herein before specified. The Contractor shall not be responsible for the cost, in excess of 5% of the contracted amount, of repairing or restoring damage to the Work, if the damage was proximately caused by an earthquake in excess of a magnitude of 3.5 on the Richter Scale or by tidal wave' s; provided that the Work damaged was built in accordance with accepted and applicable building standards, and the plans and specifications of the District.

(b) Contractor shall effectively secure and protect adjacent property and structures, livestock, crops and other vegetation. If applicable, the Contractor shall open fences on or crossing the right-of-way and install temporary gates of sound construction thereon so as to prevent the escape of livestock. Adjacent fence posts shall be adequately braced to prevent the sagging or slackening of the wire. Before such fences are opened, the Contractor shall notify the owner or tenant of the property and, where practicable, the opening of the fence shall be in accordance with the wishes of said owner or tenant. The Contractor shall be responsible that no loss or inconvenience shall accrue to the owner or tenant by virtue of their fences having been opened or the gate not having been either shut or attended at all times. Where special types of fences are encountered, the Contractor shall install temporary gates made of similar materials and of suitable quality to serve the purposes of the original fences. In all cases where the Contractor removes fences to obtain workroom, the Contractor shall provide and install temporary fencing as required, and on completion of construction shall restore the original fence to the satisfaction of the District's Representative. All costs of providing, maintaining and restoring gates and fencing shall be home by the Contractor. The Contractor shall provide and maintain all passageways, guard fences, lights and other facilities for protection required by public authority or local conditions.

(c) The Contractor shall use extreme care during construction to prevent damage from dust to crops and adjacent property. The Contractor, at its own expense, shall provide adequate dust control for the right-of-way and take other preventative measures as directed by the Engineer.

(d) The Contractor shall be responsible for all damage to any property resulting from trespass by the Contractor or its employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor.

(e) The Contractor shall see that the Site is kept drained and free of all ground water and any other water, which may impede the progress or execution of the Work.

(f) The Contractor shall be responsible for any damage caused by drainage or water runoff from construction areas and from construction plant areas.

(g) In an emergency affecting the safety of life, the Work, or adjoining property, the Contractor, without special instruction or authorization from the District is hereby permitted to act at its discretion to prevent such threatened loss or injury,

and the Contractor shall so act without appeal if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined as specified hereinabove. Should the District deem an emergency condition to exist, the Contractor shall immediately do those things and take those steps ordered by the District,. The decision of the District in this respect shall be final and conclusive. Any claims for compensation made by the Contractor on account of emergency work shall be determined as specified hereinabove.

(h) Except as provided by Government Code section 4215, the Contractor shall be responsible for the removal, relocation and protection of all public and private utilities, including irrigation facilities in the nature of utilities, located on the site of the construction project if and to the extent that the same are identified in the Contract Documents, and the Contractor shall not be entitled to any extension of time or claim for damages for extra compensation in connection therewith. If and to the extent that such utilities or facilities are not identified in the Contract Documents, as between the Contractor and the District, the District will be responsible for the cost of their removal, relocation or protection, as the case may be, but the Contractor shall perform any such work in conformance with this Contract, if so directed by the District. In such situations the Contractor shall not be responsible for delay in completion of the project caused by the failure of the District or the owner of the utility to provide for such removal or relocation. If the Contractor, while performing the Contract, discovers utility or irrigation facilities not identified by the District in the Contract Documents, the Contractor shall immediately notify the District in writing.

(i) Subject to the provisions of this section, where the Work to be performed under the Contract crosses or otherwise interferes with existing streams, watercourses, canals, farm ditches, pipelines, drainage channels, or water supplies, the Contractor shall provide for such watercourse or pipelines and shall perform such construction during the progress of the Work so that no damage will result to either public or private interests, and the Contractor shall be liable for all damage that may result from failure to so provide during the progress of the Work.

5.27. ACCIDENTS

(a) The Contractor shall provide and maintain, in accordance with Labor Code section 6708 and OSHA requirements, adequate emergency first-aid treatment for its employees and anyone else who may be injured in connection with the Work.

(b) The Contractor shall promptly report in writing to the District's Representative all accidents whatsoever arising out of or in connection with, the performance of the Work, whether on or adjacent to the site, which caused death, personal injury, or property damage, giving full details and statements of witnesses.

In addition, if death or serious injury or serious damage are caused, the accident shall be reported immediately by telephone or messenger to the District and the Engineer.

(c) If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the District's Representative, giving full details of the claim.

5.28. NO PERSONAL LIABILITY

Neither the District, the Architect, nor any of their other officers, agents, or employees shall be personally responsible for any liability arising under the Contract, except such obligations as are specifically set forth herein.

SECTION 6

PROGRESS AND COMPLETION OF WORK

6.01. PROGRESS SCHEDULE

The Contractor shall submit within ten (10) days after execution of the Contract a detailed work schedule(s) which shall detail the actions of the Contractor and Subcontractors working at the Site, and proposed milestones. This schedule(s) shall both show the dates at which the Contractor will start and complete and conform to the completion time specified in the Contract. The controlling operation, defined as the least float path, if any, shall be identified.

The Contractor shall review, revise and resubmit the progress schedule at least once a month to reflect progress. In any event, Contractor shall submit, at any time during the contract period, a current schedule to the District's Representative at the District's Representative's request.

No progress payments will be made for any work performed until a satisfactory schedule has been submitted and approved by the District's Representative. An updated schedule shall be required from the Contractor if the project falls ten (10) working days behind schedule.

If the Work falls behind the accepted schedule, the Contractor shall promptly take whatever actions are necessary to put the project back on schedule. For delays or portions of delays for which the Contractor is responsible, no payment will be made or time extension allowed for increase in work force, equipment, and working hours needed to put the project on schedule.

6.02. COMMENCEMENT AND PROGRESS OF THE WORK AND TIME OF COMPLETION

(a) Commencement

The Contractor shall begin the Work after receiving a Notice to Proceed within the period of time set forth in the Contract Provisions. Thereafter, Contractor shall diligently prosecute the Work to completion as specified in the Contract Documents. The District's Representative shall have the right to specify the locations where Contractor shall start and proceed with the Work.

A preconstruction conference will be convened after the Contractor has delivered the necessary bonds, insurance certificates and signed agreement in proper form as required in the request for proposals and general conditions of these specifications. Prior to any work, the Contractor shall provide the District's Representative with a list of key personnel assigned to the project and the telephone numbers where they may be reached at any time. The list shall be made available in sufficient copies and presented at the preconstruction conference.

Notwithstanding any other provisions of the Contract, the District shall not be obligated to accept or pay for any work furnished by the Contractor prior to the issuance of the Notice to Proceed whether or not the District has knowledge of the furnishing of such work. The Contractor shall not commence with work on this project until its Contract bonds and evidence of insurance comply with all Contract requirements and a Notice to Proceed has been issued.

The Contractor shall notify the District's Representative in writing two (2) working days (48 hours) prior to commencement of work on the Project or scheduling work for a Saturday, Sunday, or District Holiday. Failure to provide said notification will void the District's obligation to provide inspection. Any work done in the absence of the District's Inspector shall be subject to rejection.

(b) Completion

All work under this Contract shall be completed within the period of time set forth in the Contract Provisions. The Contract shall be deemed completed when the District has certified the completion of the Project as provided in Section 9.07 of these General Conditions.

6.03. SUSPENSION OF WORK

(a) The District may at any time, by notice in writing to the Contractor, suspend any part of the Work for such period of time as may be necessary to prevent improper execution of the Work on the project by the Contractor, its Subcontractors or agents, and the Contractor shall have no claim for damages or additional compensation on account of any such suspension.

(b) The District may at any time suspend any part or all of the Work upon ten (10) days written notice to the Contractor, who shall thereupon discontinue all work suspended except for all operations to prevent loss or damage to work already executed as may be directed by the District. Work shall be resumed by the Contractor after such suspension on written notice from the District.

(c) In the event of any suspension of the Work in whole or in part under subsection (B) above, the Contractor shall be entitled to an extension of time wherein to complete the Work to the extent of the delay caused to the Contractor thereby.

(d) In the event the entire work shall be suspended by order of the District, as herein above provided, and shall remain so suspended for a period of sixty (60) consecutive days, through no fault of the Contractor, and notice to resume the Work shall not have been served on the Contractor as herein above provided, Contractor may, at its option, by written notice to the District, terminate the Contract in the same manner as if the termination had been initiated by the District, and the District shall have no claim for damages because of such termination of the Contract.

6.04. DELAY IN THE WORK – TIME EXTENSIONS

The Contractor shall at all times employ such force, plant, materials, and tools as will be sufficient, in the opinion of the District, to prosecute the Work at not less than the rates fixed under the terms of the Contract and to complete the Work thereof within the time limits fixed therein. If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will ensure the completion within the time specified in the Contract, or any extension thereof, or fails to complete said work within such time, the District may exercise the termination provisions set forth in Section 6.056, below.

(a) Excusable Delays. Excusable delays shall be delays in the controlling operation of the Contractor's work due to strikes, lockouts by others, fire, unusual delay in transportation, unavoidable casualties, adverse weather conditions which could not have been reasonably anticipated, or any other act(s) of God beyond the Contractor's control, or by delay authorized by the District, or by any cause which the

District shall decide to justify the delay. Except as provided in Section 6.04(f), below, in the event of an excusable delay, the time of completion shall be extended for such reasonable time as the District may decide. The Contractor's right to an extension of time for an excusable delay is expressly subject to Contractor's giving written notice of such claim within ten (10) days following the date the Contractor knew or should have known of the delay. Failure to give such notice shall be construed as a waiver of such right. It is understood and agreed that extensions of time shall be the Contractor's sole and exclusive remedy for excusable delays.

(b) Compensable delays. Compensable delays shall be delays in the controlling operating of the Contractor's work due to acts or neglect of the District, its employees or those under it by contract or otherwise, or by changes ordered in the work. In the event of a compensable delay, the time of completion shall be extended for such reasonable time as the District may decide. In addition, the Contractor may recover its direct costs as provided in Section 6.05. The Contractor's remedies for compensable delays are expressly subject to Contractor's giving ten (10) days written notice of such claim from the date the Contractor knew or should have known of the delay. It is understood and agreed that the Contractor's sole and exclusive remedies for compensable delays shall be an extension of the time and recovery of its direct costs as compensable hereunder, but only in accordance with the provisions of the Contract Documents.

(c) Contractor and District understand and agree that the Contract time for the completion of this project is a very important part of the contract. Extensions of time will only be granted as provided above when events actually cause the Contractor to be delayed in the performance of that schedule activity which is the controlling operation as of the time of the delay. When acts or omissions occur which could cause delay, Contractor will take all reasonable means in order to be able to continue to work as scheduled without any delay, or as short a delay as possible. Additionally, if inclement weather causes accumulation of standing water on the work site or other conditions which might cause delay, Contractor shall take all measures reasonably necessary to permit work to continue as quickly as possible.

(d) If adverse weather conditions are the basis for a claim for additional time, such claim shall be documented by date substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction. Adverse weather conditions shall be considered only as those conditions that exceed the average annual number of rain days and rain quantities as established by the Annual Local Climatological Summary and NOAA National Technical Memorandum NWS WR-65 (Revised) as published by the United States Government, National Weather Service, National Climate Center, Asheville, North Carolina.

(e) The District shall be responsible for determining when adverse weather conditions result in non-workable days. It shall be the Contractor's duty to stay informed of such determinations by the District. The Contractor may object to such adverse weather determinations by filing with the Engineer a written notice of objection. The notice of objection shall state the basis of the objection and provide supporting documentation, which substantiates that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction. All such notices of objection shall be filed within three (3) days of the day in dispute. It is hereby

agreed that the Contractor's failure to submit a written notice of objection within three (3) days of the District's adverse weather determination shall constitute a waiver by the Contractor of all its rights to further protest, judicial or otherwise.

(f) The District will, within a reasonable period of time, issue a ruling on the Contractor's notice of objection. All such rulings by the District shall be final, unless the Contractor files a written protest within fifteen (15) days of the Engineer's ruling. This protest shall clearly state the basis of the dispute. Such protest will be forwarded promptly to the District, which will issue a decision on each such protest. The District decision will be final. Pending the District decision, the Contractor shall proceed with its work in accordance with the District's ruling and/or instructions. It is hereby agreed that the Contractor's failure to file a protest within fifteen days (15) of the District's ruling shall constitute a waiver by the Contractor of all its rights to further protest, judicial or otherwise.

(g) The number of days that are anticipated to be non-workable due to adverse weather conditions shall be 15. Days deemed non-workable by the District in excess of such anticipated number shall be considered excusable delays.

(h) Unexcused delays shall be delays in the Contractor's work due to acts or neglect of the Contractor, its employees, subcontractors or those under it by contract or otherwise. In the event of an unexcused delay, the Contractor expressly agrees that it shall not be entitled to either an extension of time or recovery of its costs.

(i) A request for an extension of time, or the granting of an extension of time, shall not constitute a basis for any claim against the District for additional compensation or damages unless caused by the District or another contractor employed by the District.

6.05. DAMAGES FOR DELAY

In the event of compensable delay, the District shall only be liable for idle equipment, idle workers and the necessary costs of transporting equipment. The District shall be liable to the extent that the compensable delay is concurrent with excusable delays or contractor caused delays to the controlling operation. The allowable costs shall be as for force account work under Section 2.04 with the following exceptions:

(a) The Delay Factor in the Labor Surcharge and Equipment Rental Rules applies to each equipment rental rate;

(b) The daily number of payable hours shall equal the normal working hours during the delay, not to exceed eight (8) hours per day; and

(c) No markups will be added.

6.06. TERMINATION FOR CONVENIENCE

If at any time before completion of the Work, the District determines that it is either impossible or against the interests of the District to complete the Work, or if the Work is stopped by an injunction of a court of competent jurisdiction or by order of any competent authority, the District may, upon ten (10) days written notice to the Contractor, discontinue the Work and terminate the Contract. Upon service of such notice of termination, the Contractor shall discontinue the Work in such manner, sequence, and at such times as described below. The

Contractor shall have no claim for damages for such discontinuance or termination, nor any claim for anticipated profits on the Work thus dispensed with, nor any other actually performed up to the time of discontinuance, including any Extra Work ordered by the Engineer to be done, nor for any claim for liquidated damages.

Termination of the Contract for convenience and the total compensation payable to the Contractor in the event of termination shall be governed by the following:

(a) The District will issue the Contractor a written notice signed by the District, specifying that the Contract is to be terminated. Upon receipt of said written notice and, except as otherwise directed in writing by the Engineer, the Contractor shall:

(1) Stop all Work under the Contract except that specifically directed to be completed prior to Acceptance.

(2) Perform Work the District deems necessary to secure the project for termination.

(3) Remove equipment from the site of the Work.

(4) Take such action as is necessary to protect materials from damage.

(5) Notify all Subcontractors and suppliers that the Contract is being terminated and that their contracts or orders are not to be further performed unless otherwise authorized in writing by the District.

(6) Provide the District with an inventory list of all material previously produced, purchased or ordered from suppliers for use in the Work and not yet used in the Work, including its storage location, and such other information as the District may request.

(7) Dispose of material not yet used in the Work as directed by the District.

It shall be the Contractor's responsibility to provide the District with good title to all materials purchased by the District hereunder, including material for which partial payment has been made and with bills of sale or other documents of title for such materials.

(8) Subject to the prior written approval of the District, settle all outstanding liabilities and all claims arising out of subcontracts or orders for material terminated hereunder. To the extent directed by the District, the Contractor shall assign to the District all the right, title and interest of the Contractor under subcontracts or orders for materials terminated hereunder.

(9) Furnish the District with the documentation required to be furnished by the Contractor under the provisions of the Contract including, on projects as to which Federal funds are involved, all documentation required under the Federal requirements included in the Contract.

(10) Take such other actions as the District may direct.

(b) Termination of the Contract shall not relieve the Contractor of responsibility for damage to materials except as follows:

(1) The Contractor's responsibility for damage to materials for which partial payment has been made and for materials furnished by the District for use in the Work and unused shall terminate when the District certifies that such materials have been stored in the manner and at the locations he or she has directed.

(2) The Contractor's responsibility for damage to materials purchased by the District subsequent to the issuance of the notice that the Contract is to be terminated shall terminate when title and delivery of such materials has been taken by the District.

(3) When the District determines that the Contractor has completed the Work under the Contract directed to be completed prior to termination and such other Work as may have been ordered to secure the project for termination, he or she will recommend that the District formally accept the Contract, and immediately upon and after such Acceptance by the District, the Contractor will not be required to perform any further Work thereon and shall be relieved of his or her Contractual responsibilities for injury to persons or damage to property which occurs after the formal Acceptance of the project by the District.

(c) The total compensation to be paid to the Contractor shall be determined by the District on the basis of the following:

(1) The reasonable cost to the Contractor, without profit, for all Work performed under the Contract, including mobilization, demobilization and Work done to secure the project for termination. Reasonable cost will include a reasonable allowance for project Overhead and general administrative Overhead not to exceed a total of seven (7%) percent of Direct Costs of such Work.

(2) A reasonable allowance for profit on the cost of the Work performed as determined under Section 2.04(a), above, provided the Contractor establishes to the satisfaction of the District that it is reasonably probable that he or she would have made a profit had the Contract been completed and provided further, that the profit allowed shall in no event exceed four (4%) percent of said cost.

(3) The reasonable cost to the Contractor of handling material returned to the vendor, delivered to the District or otherwise disposed of as directed by the District.

(4) A reasonable allowance for the Contractor's administrative costs in determining the amount payable due to termination of the Contract.

All records of the Contractor and the Subcontractors, necessary to determine compensation in accordance with this section shall be open to inspection or audit by representatives of the District at all times after issuance of the notice that the Contract is to be terminated and for a period of three (3) years, and such records shall be retained for that period.

After Termination of the Work by the District, the District may make payments on the basis of interim estimates pending issuance of the Final Statement, when in its opinion the amount thus paid, together with all amounts previously paid or allowed, will not result in total compensation in excess of that to which the Contractor will be entitled.

All payments, including payment upon the Final Statement, shall be subject to deduction for prior payments and amounts, if any, to be kept or retained under the provisions of the Contract.

(d) The provisions of this section shall be included in all subcontracts.

6.07. TERMINATION FOR DEFAULT

(a) In the event of any default by the Contractor as described below, the District may, after giving ten (10) days' written notice to the Contractor, terminate the Contractor's right to proceed with the Work or any part of the Work in the District's sole discretion. Events of default include:

(1) Failure or refusal to prosecute the Work, or any separable part thereof, with such diligence as will ensure the completion within the time specified in the Contract, or any extension thereof, or failure to complete said work within such time.

(2) Filing of bankruptcy by the Contractor, or the making of a general assignment for the benefit of its creditors, or appointment of a receiver on account of Contractor's insolvency without discharge of the receiver within ten (10) days after its appointment.

(3) Failure to make prompt payments to Subcontractors or suppliers.

(4) Persistent disregard of laws, ordinances, or the instructions of the Engineer, or other substantial violation of any provision of the Contract.

(b) In the event the right of the Contractor to proceed with the Work, or any portion thereof, has been terminated because of the default of the Contractor and the Contractor has been given ten (10) days' notice to cure such fault and has not done so, the District may take over the Work and prosecute the same to completion by contract or any other method the District deems expedient, and may take possession of and utilize in completing the Work such materials, appliances, equipment and plant as may be on the site of the Work and necessary therefore. In such event, the Contractor and its sureties shall be liable for all damages including costs of managerial and administrative services, engineering, legal and other consultant fees, and liquidated damages sustained or incurred by the District.

(c) Upon termination, the Contractor shall not be entitled to receive any further payment until the Work is finished. If upon completion of the Work the total cost to the District, including engineering, legal and other consultant fees, costs of managerial and administrative services, construction costs, and liquidated damages shall be less than the amount which would have been paid if the Work had been completed by the Contractor in accordance with the terms of the Contract, then the difference shall be paid to the Contractor in the same manner as the final payment under the Contract. If the total cost incurred by the District on account of termination of the Contract and subsequent completion of the Work by the District by whatever

method the District may deem expedient shall exceed said amount which the Contractor would otherwise have been paid, the Contractor and its sureties shall be liable to the District for the full amount of such excess expense.

(d) The rights and remedies of the District provided in this section are in addition to any of the rights and remedies provided by the law or under this Contract.

(e) Liquidated Damages

(1) It is agreed by the parties to this Contract that time is of the essence. In the event all the Work is not completed before or upon the expiration of the time limit as set in the Proposal, Contract and/or Progress Schedule, or within any time extensions that may have been granted, damage will be sustained by the District; and that it may be impracticable to determine the actual amount of damage by reason of such delay. Accordingly, it is agreed that the Contractor shall pay to the District as damages the amount set forth for each and every day's delay in finishing the Work in excess of the number of days specified. Liquidated damages shall be paid at a rate of **one thousand dollars ($1,000) per day** unless otherwise stated in the Contract Documents. The parties expressly agree that the liquidated damage clause found in the Contract Documents is reasonable under the circumstances existing at the time the Contract was made. The District shall have the right to deduct the amount of liquidated damages from any money due or to become due the Contractor.

(2) In addition, the District shall have the right to charge to the Contractor and to deduct from the final or progress payments for the Work the actual cost to the District of legal, engineering, inspection, superintendence, and other expenses, which are directly chargeable to the Contract and which accrue during the period of such delay, except that the cost of final inspection and preparation of the final estimate shall not be included in the charges.

(f) Exclusions

The Contractor shall not be liable for liquidated damages or delays caused by the removal or relocation of utilities when such removal or relocation is the responsibility of the District or the owner of the utility under Government Code section 4215.

6.08. CLEAN-UP

During the progress of the Work, the Contractor shall maintain the Site and related structures and equipment in a clean, orderly condition and free from unsightly accumulation of rubbish. All waste materials shall be removed daily from the Site and disposed of by the Contractor by any proper means at its own expense unless designated otherwise on the plans. No waste materials shall be placed in the public street right-of-way. Unless otherwise specified, all existing piping, materials and/or equipment removed pursuant to this Contract shall become the Contractor's property.

Upon completion of the Work and before the final estimate is submitted, the Contractor shall, at its own cost and expense, remove from the vicinity of the Work all plants, buildings,

rubbish, unused work materials, concrete forms, and temporary bridging and other like materials, belonging to the Contractor or used under the Contractor's direction during the construction, and in the event of the Contractor's failure to do so, the same may be removed by the District after ten (10) calendar days' notice to the Contractor. Such removal shall be at the expense of the Contractor.

The Contractor shall use care in the removal of materials and equipment so as not to cause damage to existing facilities and structures. Contractor shall assume liability for all such damage. Where the construction has crossed yards or driveways, restoration shall be by the Contractor to the complete satisfaction of the Engineer, at the Contractor's expense.

The Contractor shall make its own arrangements for the disposal of waste materials. If the Contractor elects to dispose of such materials on private property, Contractor shall obtain written permission from all property owners involved.

SECTION 7

MEASUREMENT AND PAYMENT

7.01. SCOPE OF PAYMENT

(a) The Contractor shall accept the compensation provided in the Contract as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the acceptance by the District and for all risks of every description connected with the prosecution of the Work, also for all expenses incurred in consequence of the suspension or discontinuance of the work as provided in the Contract; and for completing the Work according to the Specifications and Plans. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

(b) No compensation will be made in any case for loss of anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as provided in such agreements.

(c) The Work includes the preparatory work and operations needed for mobilization and demobilization of the Project. The Work, however, does not include establishing the Engineer's field facility(s) of utility work and connections needed for these facilities.

7.02. PROGRESS PAYMENTS -

(a) The District will pay the Contractor ninety-five percent (95%) of the amount of each progress estimate within thirty (30) days after receipt of an undisputed and properly submitted progress estimate from the Contractor, unless the District has made a finding pre-proposals pursuant to Public Contract Code section 7201(b)(4) justifying a larger retention. If the District fails to pay an undisputed progress estimate within the allotted thirty (30) days, the District shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (A) of section 685.010 of the Code of Civil Procedure. Five percent (5%) of the amount of each estimate shall be retained by the District until final completion and acceptance of all work under the Contract.

(b) DRAFT APPLICATION FOR PAYMENT

(1) One week prior to submitting the Application for Payment submit a marked-up copy of the previous Application for Payment showing the changes in progress that will be the basis for the new Application for Payment.

(c) BILLING MEETINGS

(1) A billing meeting shall be conducted by District's Representative each month prior to submittal of the Application for Payment.

(2) Location: As designated by District's Representative.

(3) Attending shall be:

(i) District's Representative.

(ii) Contractor's Superintendent or Project Manager

(iii) Subcontractors, as appropriate.

(iv) Others, as appropriate.

(d) SCHEDULE OF VALUES

(1) Coordination. Coordinate preparation of the Schedule of Values with preparation of the Contractor's Contract Schedule and as directed by the District's Representative.

(i) Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

(1) Contractor's Contract Schedule.

(2) Application for Payment form.

(3) List of Subcontractors

(4) Schedule of Alternates (if any).

(5) List of products (where/if appropriate).

(6) List of principal supplier and fabricators.

(7) Schedule of submittals.

(8) Construction Cost Breakdown Sheet.

(2) Submit the Schedule of Values to the District's Representative at the earliest feasible date, but in no case later than 7 days before the date scheduled for Submittal of the Initial Application for Payment.

(3) Format and Content. Use the [Specification] [Project Manual] Table of Contents as a guide to establish the format for the Schedule of Values.

(i) Include the following Project identification on the Schedule of Values:

(1) Project name, number and location.

(2) Name of the District's Representative.

(3) Project Number.

(4) Contractor's name and address.

(5) Date of Submittal.

(4) Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

(i) Generic name.

(ii) Specification section.

(iii) Name of Subcontractor.

(iv) Name of manufacturer or fabricator.

(v) Name of supplier (if appropriate).

(vi) Change orders (numbers) that have affected value.

(vii) Dollar value. (Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.)

(5) Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.

(6) Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.

(7) For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

(i) Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

(8) Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work. Each item in the Schedule of Values and Application for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

(i) General Conditions Work Items, such as temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values.

(9) Allowances (if applicable). Show the line item value of allowances.

(10) Schedule of Values Updating. Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or contract directives result in a change in the Contract Sum.

(i) Each Change Order shall become a new line item.

(e) APPLICATIONS FOR PAYMENT

(1) No portion of an Application for Payment which includes a request for payment of a Change Order not yet fully executed will be approved by District's Representative.

(2) Each Application for Payment shall be consistent with previous applications and payments as certified by the District's Representative and paid for by the District.

(i) The Initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

(ii) Entries shall match data on the Schedule of Values and the Contractor's Contract Schedule.

(iii) Any payment request determined not to be a proper payment request suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. A request returned pursuant to this section shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

(iv) The number of days available to the District to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the District exceeds the seven-day return requirement set forth in

(v) When, in the judgment of the District the Work is not proceeding in accordance with the provisions of the Contract, or when in the District's judgment the total amount of the Work done since the last estimate amounts to less than one thousand dollars ($1,000), no pay estimate will be prepared and no progress payment will be made.

(3) Payment Application Times. Unless otherwise agreed in writing, the date of each progress payment is indicated in the General Conditions. The period of Work covered by each Application for Payment shall be for the Work as indicated in the General Conditions.

(4) Submittal. Submit executed copy of the Application for Payment to the District's Representative by means of ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien and similar attachments, when required.

(i) Transmit copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the District's Representative.

(ii) With each Application for Payment, submit lien release waivers of from every entity who may lawfully be entitled to file a lien arising out of the Contract, and related to the Work covered by the payment.

(5) Initial Application for Payment for Construction Work. Administrative actions and submittals that must precede or coincide with submittal of the Initial Application for Payment for Construction Work include the following:

(i) List of Subcontractors.

(ii) List of principal suppliers and fabricators.

(iii) Schedule of Values.

(iv) Contractor's updated Contract Schedule.

(v) Schedule of principal products.

(vi) Submittal Schedule (preliminary if not final).

(vii) Certificates of insurance and insurance policies.

(viii) Data needed to acquire District's insurance.

(6) Application for Payment at Substantial Completion. Following issuance of the Certification of Substantial Completion, submit an Application for Payment. This application shall reflect any certificates of Beneficial Occupancy issued previously for District occupancy of designated portions of the Work. Administrative actions and submittals that shall precede or coincide with this application include:

(i) Occupancy permits and similar approvals.

(ii) Warranties (guarantees) and maintenance agreements.

(iii) Test/adjust/balance records.

(iv) Maintenance instructions.

(v) Meter readings.

(vi) Start-up performance reports.

(vii) Change-over information for District's occupancy, use, operation and maintenance.

(viii) Final progress photographs (if any).

(ix) List of incomplete Work, recognized as exceptions to Certificate of Substantial Completion.

(x) Final Cleaning.

(xi) Building Commissioning

(xii) Final list of Contractor installed equipment, including total installed value (Equipment Schedule of Values).

(7) Final Payment Application. Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:

(i) Completion of Project closeout requirements.

(ii) Completion of items specified for completion after Substantial Completion.

(iii) Assurance that unsettled claims will be settled.

(iv) Assurance work not complete and accepted will be completed without undue delay.

(v) Transmittal of required Project construction records to the District.

(vi) Proof that taxes, fees and similar obligations have been paid.

(vii) Removal of temporary facilities and services.

7.03. PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

A prime contractor or subcontractor shall pay any subcontractor not later than seven (7) days of receipt of each progress payment in accordance with the provisions in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The seven (7) days is applicable unless a longer period is agreed to in writing. Any delay or postponement of payment over thirty (30) days may take place only for good cause and with the District's prior written approval. Any violation of Section 7108.5 shall subject the violating contractor or subcontractor to the penalties, sanctions and other remedies of that section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime contractor, deficient subcontract performance, or noncompliance by a subcontractor. This provision applies to both DBE and non-DBE subcontractors.

7.04. LIENS AND STOP NOTICES

The Contractor agrees to keep the Work, the site of the Work and all monies held by the District free and clear of all liens and stop notices related to labor and materials furnished in connection with the Work, if permitted by law. Furthermore, the Contractor waives any right it may have to file any type of lien or stop notice in connection with the Work. Notwithstanding anything to the contrary contained in the Contract Documents, if any such lien or stop notice is filed or there is evidence to believe that lien or stop notice may be filed at any time during the progress of the Work or within the duration of this Contract, the District may refuse to make any payment otherwise due the Contractor or may withhold any payment due the Contractor a sum

sufficient in the opinion of the District to pay all obligations and expenses necessary to satisfy such lien or stop notice. The District may withhold such payment unless or until the Contractor, within ten days after demand therefor by the District, shall furnish satisfactory evidence that the indebtedness and any lien or stop notice in respect thereof has been satisfied, discharged and released of record, or that the Contractor has legally caused such lien or stop notice to be released of record pending the resolution of any dispute between the Contractor and any person or persons filing such lien or stop notice. If the Contractor shall fail to furnish such satisfactory evidence within ten days of the demand therefor, the District may discharge such indebtedness and deduct the amount thereof, together with any and all losses, costs and damages suffered or incurred by the District from any sum payable to the Contractor under the Contract documents, including but not limited to final payment and retained percentage. This section shall be specifically included in all Subcontracts and purchase orders entered into by the Contractor.

7.05. FINAL ACCEPTANCE AND DATE OF COMPLETION

Whenever the Contractor shall deem all Work under this Contract to have been completed in accordance therewith, the Contractor shall so notify the District in writing, and the District shall promptly ascertain whether the Work has been satisfactorily completed and, if not, shall advise the Contractor in detail and in writing of any additional work required. When all the provisions of the Contract have been fully complied with, to the satisfaction of the District , the District shall proceed with all reasonable diligence to determine accurately the total value of all Work performed by the Contractor at the prices set forth in the Contract or fixed by Change Orders, and the total value of all extra work, all in accordance with the Contract. The District will then certify to said final estimate and to the completion of the Work, and will file copies thereof with the District and the Contractor, and shall cause a Notice of Completion to be filed with the Los Angeles County Clerk-Recorder. The date of final completion shall be the date of filing of the Notice of Completion. All guarantees, warranties, and securities securing said guarantees and warranties, shall commence on said date of final completion.

7.06. RIGHT TO WITHHOLD PAYMENTS

(a) In addition to all other rights and remedies of the District hereunder and by virtue of the law, the District may withhold or nullify the whole or any part of any partial or final payment to such extent as may reasonably be necessary to protect the District from loss on account of:

(1) Defective work not remedied, irrespective of when any such work be found to be defective;

(2) Claims or liens filed or reasonable evidence indicating probable filing of claims or liens including, but not limited to claims under Sections 1775, 1776, or 1777.7 of the Labor Code;

(3) Failure of the Contractor to make payments properly for labor, materials, equipment, or other facilities, or to subcontractors and/or suppliers;

(4) A reasonable doubt that the Work can be completed for the balance then unearned;

(5) A reasonable doubt that the Contractor will complete the Work within the agreed time limits;

(6) Costs to the District resulting from failure of the Contractor to complete the Work within the proper time; or

(7) Damage to work or property.

(b) Whenever the District shall, in accordance herewith, withhold any monies otherwise due the Contractor, written notice of the amount withheld and the reasons therefor will be given the Contractor. After the Contractor has corrected the enumerated deficiencies, the District will promptly pay to the Contractor the amount so withheld. When monies are withheld to protect the District against claims or liens of mechanics, material men, Subcontractors, etc., the District may at its discretion permit the Contractor to deliver a surety bond in terms and amount satisfactory to the District, indemnifying the District against any loss or expense, and upon acceptance thereof by the District, the District shall release to the Contractor monies so withheld.

7.07. FINAL PAYMENT

Within ten (10) days after the date of completion, the District will file in the Office of the County Recorder, a Notice of Completion of the Work herein agreed to be done by the Contractor. Within sixty (60) days of completion defined in Public Contract Code section 7107, the difference between said final estimate and all payments theretofore made to the Contractor shall be due and payable to the Contractor, subject to any requirements concerning the furnishings of a maintenance bond, and excepting only such sum or sums as may be withheld or deducted in accordance with the provisions of this Contract. All prior certifications upon which partial Payments may have been made, being merely estimates, shall be subject to correction in the final certificate.

7.08. FINAL RELEASE

Final payment to the Contractor in accordance with the final estimate is contingent upon the Contractor furnishing the District with a signed written release of all claims against the District arising by virtue of the Contract. Disputed Contract claims in stated amounts may be specifically excluded by the Contractor from the operation of the release. The release shall be in substantially the form specified in California Civil Code section 8138.

PART 4: GEOTECHNICAL UPDATE REPORT

Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

July 19, 2023 Project No. 23-7751

Altadena Library District
Ms. Jennifer Pearson, AIA
Architect, Program Manager
8640 National Boulevard
Culver City, CA 90232

Subject: Geotechnical Update Report, Proposed Renovation, Main Library, Altadena Library District, 626 East Mariposa Street, Altadena, California

Jennifer,

In accordance with your request and authorization, TGR Geotechnical, Inc. (TGR) has prepared this geotechnical update report for the proposed improvements at the Altadena Main Library in Altadena, California. This report presents geotechnical design and grading recommendations for the proposed development. These recommendations were developed based on our review of the previous study performed by Byer Geotechnical, Inc. (2012), our site visit, a review of the current proposed development plan and the 2022 California Building Code. The work was performed in general accordance with our proposal dated June 14, 2023.

Based on our study the proposed development is feasible from a geotechnical viewpoint provided the recommendations presented in this report are implemented during design and construction.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

TGR GEOTECHNICAL, INC.



Robert Aguilar
Staff Engineer

Sanjay Govil, PhD, PE, GE 2382
Principal Geotechnical Engineer

Distribution: (1) Addressee

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

ATTACHMENTS

Plate 1 – Boring and Test Pit Location Map

Figure 1 – Site Location Map
Figure 2 – Regional Geology Map
Figure 3 – Historic High Groundwater Map
Figure 4 – Regional Fault Map
Figure 5 – Seismic Hazard Zone Map
Figure 6 – Slot Cut Calculations

Appendix A – References
Appendix B – Log of Borings and Test Pits by Byer Geotechnical (2012)
Appendix C – Laboratory Testing Results by Byer Geotechnical (2012)
Appendix D – Site Seismic Design Parameters

INTRODUCTION

Site Descriptions and Proposed Project Development

The subject site is located on the northeast corner of East Mariposa Street and Santa Rosa Avenue, in Altadena, California (Figure 1). The subject site is a currently occupied by the Altadena Library. It is our understanding that the proposed improvements consist of approximately 4,000 square feet of additions and a full renovation of the existing building. The proposed additions consist of a new community room on the southwest corner of the library, a new entry/lobby and maker space desk on the south side of the library, a new amphitheater on the north side of the library and an elevator in the center of the library.

Scope of Work

The scope of work for this geotechnical investigation included the following:

- Site reconnaissance and review of the referenced report by Byer Geotechnical (2012) for the subject site made available to us.
- Analyses of data, including site seismicity, foundation design, retaining wall recommendations for proposed improvements, and soils engineering/earthwork with respect to the suitability of the proposed additions.
- Preparation of this updated geotechnical report presenting all previous field and laboratory data by Byer Geotechnical (2012) along with geotechnical design recommendations for the currently proposed development.

Previous Study

A previous geotechnical investigation was conducted at the subject site by Byer Geotechnical, Inc. in 2012 for an extensive improvement at the subject site. TGR has reviewed the geotechnical reports prepared by Byer Geotechnical and has developed the geotechnical recommendations provided in this report based on the current improvement plan and the 2022 California Building Code.

The investigation by Byer Geotechnical (2012) consisted of four (4) hollow stem auger borings to approximate depths ranging from 25.5 feet to 30.5 feet below existing grade and two (2) hand dug test pits to an approximate depth of 5.5 feet below existing grade. The boring and test pit logs are included in Appendix A and the associated laboratory test data has been included in Appendix B for this geotechnical update report.

GEOTECHNICAL FINDINGS

Geology

Regional Geologic Setting

The project site is located on the eastern edge of the Pasadena 7.5-minute Quadrangle, Los Angeles County, California. Per the Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California (Dibblee, 1989), the subject site is underlain by Quaternary older alluvial fan gravel and sand derived from the San Gabriel Mountains. Figure 2 presents the Regional Geology Map.

Earth Units

Based on subsurface investigations by Byer Geotechnical (2012), the subject area is underlain by approximately 1 to 7 feet of undocumented fill (Afu) overlaying old Quaternary age alluvium (Qof). The undocumented fill generally consists of silty sand with varying amounts of gravel and silt. It is assumed that the undocumented fill was derived from grading operations prior to the construction of the existing library and associated parking lot in 1961. The existing undocumented fill is considered unsuitable for the support of engineered fill and/or structures. The underlying old alluvium consists of silty sand with varying amounts of gravel to approximately 15 to 20 feet below existing grade, where gravelly sand was encountered. Detailed descriptions of the earth units encountered in Byer Geotechnical's borings and test pits are presented in Appendix B.

Groundwater

Subsurface water was not encountered to a depth of 30.5 feet below grade during the subsurface exploration by Byer Geotechnical (2012). Based on our review of available historical groundwater information, the historic high groundwater has not been mapped at the subject site (Figure 3).

The Los Angeles County Department of Public Works groundwater data from wells nearest to the subject site indicate a historic high groundwater of 192.7 feet below existing grade dating back to 1970. Well ID 4081B, State #: 1N12W10H01 is located approximately 0.9 miles east of the subject site

Seasonal and long-term fluctuations in the groundwater may occur as a result of variations in subsurface conditions, rainfall, run-off conditions and other factors. Therefore, variations may occur.

Static groundwater is not anticipated to impact the proposed development.

Expansive Soil

Based on laboratory testing by Byer Geotechnical (2012), onsite soils have a "very low" expansion potential.

Hydro Collapse

Laboratory testing by Byer Geotechnical (2012) indicates near surface soils experience 0% to 2% hydrocollapse when inundated under load, correlating to a "low" potential for hydro collapse.

Seismic Review

Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity is movement along the northwest-trending regional faults such as the San Andreas, San Jacinto and Elsinore fault zones. These fault systems produce approximately 5 to 35 millimeters per year of slip between the plates.

We consider the most significant geologic hazard to be the potential for moderate to strong seismic shaking that is likely to occur at the subject site. The subject site is located in the highly seismic Southern California region within the influence of several faults that are considered to be Holocene-active, pre-Holocene or age-undetermined faults. A Holocene-active fault is defined by the State of California as a fault that has exhibited surface displacement within the Holocene time (about the last 11,700 years). A pre-Holocene fault is defined by the State as a fault whose history of past movement is older than 11,700 years ago and does not meet the criteria for a Holocene-active fault. An age-undetermined fault is defined by the State as a fault where the recency of fault movement has not been determined.

These Holocene-active, pre-Holocene and age-undetermined faults are capable of producing potentially damaging seismic shaking at the site. It is anticipated that the subject site will periodically experience ground acceleration as the result of small to moderate magnitude earthquakes. Other Holocene-active, pre-Holocene and age-undetermined faults without surface expression (blind faults) that are not currently zoned and may be capable of generating an earthquake are known to be present in the region.

The subject site is not included within any Earthquake Fault Zones as created by the Alquist-Priolo Earthquake Fault Zoning Act (CGS, 2018). Our review of geologic literature pertaining to the site area indicates that there are no Holocene-active, pre-Holocene or age-undetermined faults located within or immediately adjacent to the subject property.

The nearest faults to the subject site are the Sierra Madre fault zone mapped approximately 1.0 mile to the northeast of the site, the San Gabriel fault zone mapped approximately 1.2 miles south of the site, the Eagle Rock fault mapped approximately 4.0 miles southwest of the site, the Raymond fault mapped approximately 4.6 miles north of the site, the Verdugo fault mapped approximately 6.4 miles southwest of the site and the Hollywood fault mapped approximately 6.5 miles southwest of the site. The Regional Fault Map, Figure 4, shows the location of the subject site in respect to the regional faults.

Secondary Seismic Hazards

Surface Fault Rupture and Ground Shaking

Since no known faults are located within the site, surface fault rupture is not anticipated. However, due to the close proximity of known active and potentially active faults, severe ground shaking should be expected during the life of the proposed structures.

Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when these ground conditions exist: 1) Shallow groundwater; 2) Low density, fine, clean sandy soils; and 3) High-intensity ground motion. Effects of liquefaction can include sand boils, settlement, and bearing capacity failures below foundations.

A review of the Earthquake Zones of Required Investigation, Pasadena Quadrangle (CGS, 1999) indicates that the subject site is not located within an area mapped as having a potential for earthquake induced liquefaction (Figure 5).

Based on the above and depth to groundwater, the potential for liquefaction at the subject site is considered to be very low.

Seismically Induced Settlement

Ground accelerations generated from a seismic event can produce settlements in sands or in granular earth materials both above and below the groundwater table. This phenomenon is often referred to as seismic settlement and is most common in relatively clean sands, although it can also occur in other soil materials. Due to the density of site soils, seismically induced settlement susceptibility is considered to be low.

Landsliding

Landsliding involves downhill motion of earth materials during or subsequent to earth shaking. Historically, landslides triggered by earthquakes have been a significant cause of damage. Areas that are most susceptible to earthquake induced landslides are areas with steep slopes in poorly cemented or highly fractured bedrock, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits.

A review of the Earthquake Zones of Required Investigation, Pasadena Quadrangle (CGS, 1999), this property is not located within a mapped zone of landsliding (Figure 5) and the property and adjacent areas are situated on relatively flat topography. Based on the above, the general landslide susceptibility is considered to be negligible.

Lateral Spreading

Seismically induced lateral spreading involves primarily movement of earth materials due to earth shaking. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. The topography in the vicinity of the subject site is relatively flat. Therefore, the potential for lateral spreading at the subject site is considered very low.

DISCUSSIONS AND CONCLUSIONS

General

Based on field exploration, laboratory testing and engineering analysis performed Byer Geotechnical (2012), it is our opinion that the proposed structure and proposed grading will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations presented in this report are incorporated during design and construction.

Conclusions

Based on our findings, the subject site is likely to be subjected to moderate ground shaking due to the proximity of known active and potentially active faults. This may reasonably be expected during the life of the structure and should be designed accordingly.

The primary conditions affecting the proposed project site development are as follows:

- Presence of 1 to 7 feet of undocumented fill.
- Excavations adjacent to existing footings.

The engineering evaluation performed concerning site preparation and the recommendations presented are based on information provided to us and obtained by us during our office and fieldwork. This report is prepared for the additions and renovation to the existing Altadena Library. In the event that any significant changes are made to the proposed development, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the recommendations of this report are verified or modified in writing by TGR.

RECOMMENDATIONS

Seismic Design Parameters

When reviewing the 2022 CBC the following parameters should be incorporated into the design. The Site Class is based on site soil conditions per Section 11.4.3 of the ASCE 7-16. It is our opinion Site Class D – Stiff Soil is the most appropriate based on site soil conditions.

Parameter	Value
Latitude (degree)	34.1891
Longitude (degree)	-118.1371
Site Class (CBC Section 1613.2.2)	D – Stiff
Site Coefficient, F_a (CBC Table 1613.2.3 (1))	1.0
Site Coefficient, F_v (CBC Table 1613.2.3 (2))	1.7
Mapped Spectral Acceleration at 0.2-sec, S_s (CBC Section 1613.2.1)	1.924 g
Mapped Spectral Acceleration at 1.0-sec, S_1 (CBC Section 1613.2.1)	0.721 g
Spectral Acceleration at 0.2-sec Adjusted for Site Class, S_{MS} (CBC Section 1613.2.3)	1.924 g
Spectral Acceleration at 1.0-sec Adjusted for Site Class, S_{M1} (CBC Section 1613.2.3)	1.226 g
Design Spectral Acceleration at 0.2-sec, S_{DS} (CBC Section 1613.2.4)	1.283 g
Design Spectral Acceleration at 1.0-sec, S_{D1} (CBC Section 1613.2.4)	0.817 g
Seismic Response Coefficient (C_s) ASCE 7-16	Per 12.8-6
Mapped MCE_G, Peak Ground Acceleration, PGA	0.830 g
Site Coefficient for Mapped MCE_G, F_{PGA}	1.1
Site Modified Peak Ground Acceleration, PGA_M	0.913 g

* Based on Equivalent Lateral Force Design Procedure Being Used.

In general, ASCE 7-16 Section 11.4.8 requires site-specific hazard analysis for structures on Site Class D for values of S_1 greater than or equal to 0.2 g. When using Equivalent lateral Force (ELF) and Modal Response Spectrum Analysis (MRSA), the ASCE 7-16 Section 11.4.8 Item 1 exception shall be utilized. Increasing *SM1* by 50% in Eq. (11.4-2) results in an increase in the value of S_{D1} determined by Eq. (11.4-4) by 50%. These increased values of S_{M1} and S_{D1} are to be used for all applications of these parameters throughout the Standard, including for the formulation of the design response spectrum where a design response spectrum is needed per this standard. It should be noted that the 50% increase in S_{D1} also increases *Ts* by 50% resulting in an extension of the acceleration-controlled plateau of the design response spectrum. *Cs* is determined in accordance with Eq. (12.8-6).

The structural consultant should review the above parameters and the 2022 California Building Code to evaluate the seismic design.

Conformance to the criteria presented in the above table for seismic design does not constitute any type of guarantee or assurance that significant structural damage or ground failure will not occur during a large earthquake event. The intent of the code is “life safety” and not to completely prevent damage of the structure, since such design may be economically prohibitive.

Foundation Design Recommendations

The proposed additions may be supported on continuous and/or spread footings. Bearing capacity recommendations for shallow foundations are presented below. These recommendations assume that the footings will be supported on a minimum of three (3) feet of engineered fill. The existing undocumented fill is considered unsuitable for the support for structures and structural fill and shall be removed and replaced with engineered fill compacted to a minimum of ninety (90) percent relative compaction. All footings shall meet the setback requirements presented in 2022 CBC.

For foundations supported on minimum three (3) feet of engineered fill with minimum ninety (90) percent relative compaction at near optimum moisture content, an allowable bearing pressure of 2,000 pounds per square foot may be used in design for a minimum footing depth of 2 feet. The bearing capacity may be increased by 300 psf per additional foot of depth, to a maximum of 3,000 psf. The recommended minimum footing depth is twenty-four (24) inches.

The minimum recommended footing width is eighteen (18) inches for continuous footings and twenty-four (24) inches for pad footings. A minimum reinforcement of two (2) No. 4 steel bar top and two (2) No. 4 steel bar bottom is required for continuous footings from a geotechnical viewpoint. Foundation design details such as concrete strength, reinforcements, etc. should be established by the Structural Engineer.

Resistance to lateral loads including wind and seismic forces may be provided by frictional resistance between the bottom of concrete and the underlying fill soils and by passive pressure against the sides of the foundations. A coefficient of friction of 0.37 may be used between concrete foundation and underlying soil. The recommended passive pressure of the engineered fill may be taken as an equivalent fluid pressure of 260 pounds per cubic foot (2,600 psf max). The above values may be increased by one-third (1/3) for short-term wind or seismic loads.

The total and differential static settlement is anticipated to be 1-inch and 0.5-inch or less over 30 feet.

Footings located near property lines or existing footings where the lateral removal cannot be achieved shall be designed for a reduced bearing capacity of 1,500 pounds per square foot and the passive resistance shall be ignored.

Retaining Wall Recommendations

The following soil parameters may be used for the design of the retaining wall with level backfill and a maximum height of six (6) feet:

Conditions	Parameters
Active (Level)	40 psf/ft
Passive	260 (maximum 2,600 psf)
Friction Coefficient	0.37

- Unrestrained retaining wall, such as a cantilever wall, the active earth pressure shall be used.
- Any import backfill shall be granular non-expansive select fill with a minimum sand equivalent of 30 The import fill should be tested and approved by TGR prior to backfill.
- Passive pressure and frictional resistance could be combined in determining the total lateral resistance. However, one of them shall be reduced by 50 percent.
- The passive pressure in the upper 6 inches of soil not confined by slabs or pavement should be neglected.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure, should be considered in the design of the retaining wall. Loads applied within a 1:1 projection from the surcharging structure on the stem of the wall shall be considered as lateral surcharge. For lateral surcharge conditions, we recommend utilizing a horizontal load equal to 50 percent of the vertical load, as a minimum. This horizontal load should be applied below the 1:1 projection plane. To minimize the surcharge load from an adjacent footing, deepened footings may be considered.

Slab-On-Grade

Slab-on-grade should be a minimum of five (5) inches thick and reinforced with a minimum of No. 4 reinforcing bar on 16-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel.

Control joints may be utilized at the discretion of the Structural engineer to reduce cracking, however the reinforcement recommended above is intended to reduce cracking and its proper placement is critical to the performance of the slab.

The subgrade material should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density at near optimum moisture content to a minimum depth of two (2) feet. The existing undocumented fill is considered unsuitable for the support for structures and structural fill and shall be removed and replaced with engineered fill compacted to a minimum of ninety (90) percent relative compaction.

The thickness and reinforcement of the slab shall be designed by the structural engineer per the 2022 California Building Code and should include the anticipated loading condition and the anticipated use of the building. For moisture sensitive flooring, the floor slab should be underlain by minimum 15-mil impermeable polyethylene membrane (Stego Wrap, Moistop Plus, or any equivalent meeting the requirements of ASTM E1745, Class A rating) as a capillary break. Sand (2-inches) may be placed above and below the impermeable polyethylene membrane at the discretion of the project structural engineer/concrete contractor for proper curing and finish of the concrete slab-on-grade and protection of the membrane and is considered outside the scope of geotechnical engineering.

Flatwork

Flatwork should be a minimum of 4-inches thick should be reinforced with a minimum of No. 3 reinforcing bar on 18-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel.

The subgrade material should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density at near optimum moisture content per ASTM D1557 to a minimum depth of one (1) foot. Prior to placement of concrete, the subgrade soils should be moistened at near optimum moisture content and verified by our field representative. The actual thickness and reinforcement of the slab shall be designed by the structural engineer and should include the anticipated loading condition.

Preliminary Pavement Design

The Caltrans method of design was utilized to develop the following asphalt pavement section. The section was developed based on a preliminary "R-Value" for compacted site subgrade soils of 50.

ASPHALT PAVEMENT SECTION			
Traffic Utilization	Asphalt (Inch)	Aggregate Base (Inch)	Total (Inch)
Light Passenger Cars	3.0	4.0	7.0
Moderate Trucks	4.0	4.0	8.0

Aggregate base material for Asphalt Pavement should consist of CAB/CMB complying with the specifications in Section 200-2.2/200-2.4 of the current "Standard Specifications for Public Works Construction" and should be compacted to at least ninety-five (95) percent of the maximum dry density per ASTM D1557. The paving asphalt performance grade (Section 203-1.2) should comply with the historic temperature changes to reduce the impact of thermal cracks. The surface of the base should exhibit a firm and unyielding condition just prior to the placement of asphalt or Portland cement concrete paving. The asphalt concrete shall be compacted to a minimum of ninety-five (95) percent relative compaction.

The pavement subgrade shall be compacted to minimum ninety (90) percent relative compaction to a depth of one (1) foot.

The R-value and the associated pavement section should be confirmed at the completion of site grading.

Cement Type and Corrosion

Based on laboratory testing by Byers Geotechnical (2012) concrete used should be designed in accordance with the provisions of ACI 318-14, Chapter 19 for Exposure Class S0: Concrete with a minimum unconfined compressive strength of 2,500 psi, and for Exposure Class C1 (Moderate) – Concrete exposed to moisture but not a significant source of chlorides, per ACI 318-14 Table 19.3.1.1.

Corrosion tests indicate a moderate corrosion potential for ferrous metals exposed to site soils.

TGR does not practice corrosion engineering. If needed, a qualified specialist should review the site conditions and evaluate the corrosion potential of the site soil to the proposed improvements and to provide the appropriate corrosion mitigations for the project.

Shrinkage/Subsidence

Removal and recompaction of the near surface soils is estimated to result in shrinkage ranging from 0 to 5 percent. Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be between one and two tenths of a foot, provided the recommendations in this report are incorporated during design and construction.

Site Development Recommendations

General

During earthwork construction, all site preparation and the general procedures of the contractor should be observed, and the fill selectively tested by a representative of TGR. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered. During construction, voids created from removal of buried elements (footings, pipelines, septic pits etc) shall be backfilled with engineered fill compacted to a minimum of ninety (90) percent relative compaction at near optimum moisture content per ASTM D1557 under the observation of TGR.

Grading

All grading should conform to the guidelines presented in the California Building Code (2022 edition), except where specifically superseded in the text of this report. Prior to grading, TGR's representative should be present at the pre-construction meeting to provide grading guidelines, if needed, and review any earthwork.

The existing undocumented fill (1 to 7 feet deep) is considered unsuitable for the support for structures and structural fill and shall be removed and replaced with engineered fill compacted to a minimum of ninety (90) percent relative compaction.

It is recommended that minimum of three (3) feet of engineered fill be placed under footings, a minimum of two (2) feet of engineered fill under slab-on-grade and a minimum of one (1) foot be placed under flatwork and pavement. Site soils may be reused as engineered fill provided they are free of oversized particles and the recommendations presented in this report are implemented. Exposed bottoms should be scarified a minimum of 6-inches, moisture conditioned at near optimum moisture and compacted to a minimum ninety (90) percent relative compaction. Subsequently, site fill soils should be recompacted to a minimum of ninety (90) percent relative compaction at near optimum moisture content.

Since it is typically not feasible to increase the moisture content of the floor slab and foundation subgrade soil once rough grading has been completed, care should be taken to maintain the moisture content of the building pad subgrade soils throughout the construction process.

The depth of over-excavation should be reviewed by the Geotechnical Consultant during the actual construction. Any subsurface obstruction buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended.

Fill Placement

Prior to any fill placement TGR should observe the exposed surface soils. The site soils may be re-used as engineered fill provided, they are free of organic content and particle size greater than 4-inches. All particles greater than 4-inches shall be removed and disposed offsite. Fill shall be moisture-conditioned at near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557. Any import soils shall be non-expansive and approved by TGR Geotechnical Inc.

Compaction

Prior to fill placement, the exposed surface should be scarified to a minimum depth of six (6) inches, fill placed in six (6) inch loose lifts moisture conditioned at near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D 1557.

Temporary Excavations

All excavations to a maximum depth of four (4) feet may be excavated vertically. However, all excavations deeper than 4 feet must either be properly sloped or shored. Where sufficient space is available for sloped excavation, the excavation may be sloped to no steeper than 1:1 (horizontal to vertical). Flattened side slopes may be required where less stable localized deposits are encountered. The exposed slope faces should be kept moist and not allowed to dry out. Where sloped excavation cannot be performed, shoring consisting of soldier pile and lagging may be utilized.

Surcharge loads should not be permitted within a distance equal to the depth of excavation from the top edge of the slopes, unless the cut is properly shored. Excavations that extend below an imaginary plane inclined at 1:1 below adjacent existing facility should be properly shored to maintain support of the adjacent structures. The contractor should be aware that slope height, slope inclination, excavation depths, and shoring design must be in compliance with local, state and federal safety regulations, e.g., OSHA Health and Safety Standards for Excavations. Excavations and shoring must be designed by a qualified registered civil engineer.

Excavations deeper than 4 feet or excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any nearby adjacent existing site facilities should be properly shored to maintain foundation support at the adjacent structures.

Temporary excavations near existing footings shall be in accordance with CBC section 1809.14.

Excavations adjacent to existing footings should have a minimum 5 feet to daylight from the top of the existing footings. As an alternative, shoring or underpinning of existing footings is recommended.

Temporary Shoring

Temporary shoring may be required for those excavations where temporary slope cuts as specified above are not feasible. Temporary cantilever shoring should be designed to resist an active earth pressure of 35 pounds per cubic foot equivalent fluid pressure for level conditions behind shoring. The design of shoring should also include surcharge-loading effects of existing structures and anticipated traffic, including construction equipment, when loading is within a distance from the shoring equal to the depth of excavation. All excavations should conform to CAL-OSHA and local safety codes. The stability of temporary excavation is the responsibility of

the contractor. However, as a minimum the lateral movement at the top of the shoring soldier piles should be monitored. Lateral deflection of 0.5 inches or more shall be brought to the attention of TGR with remedial measures. If lateral deflection exceeds 1.0-inch, work shall stop, and mitigation measures taken prior to continuing work. TGR should be present to observe the excavation to provide additional recommendations as considered necessary depending on the exposed condition.

Soldier piles shall have a minimum diameter of eighteen (18) and shall be spaced at least two diameters on centers, a lateral passive resistance of 300 psf/ft of embedment depth into competent older alluvium with a maximum lateral passive resistance of 3,000 psf should be used in design. The minimum recommended embedment is 10 feet. The point of fixity may be taken as 1 foot below grade. The shoring design engineer may utilize this passive pressure over one to two pile diameters at their discretion/design procedure. The shoring design engineer is however responsible for the performance of the shoring system.

Soldier pile members placed in drilled holes should be properly backfilled with sand/cement slurry or lean concrete in order to develop the required passive resistance.

The lagging between the soldier piles may be designed for a maximum nominal pressure of 400 psf, and should consist of wood members, or solid plywood or steel sheets. All excavations should conform to CAL-OSHA and local safety codes.

A-B-C Slot Cuts

A-B-C slots may be utilized to accomplish the over-excavation adjacent to the existing library building. The slots shall be no more than 6-foot-long/wide and the anticipated maximum depth is 7 feet. The calculations are presented on attached Figure 6. The calculations are based on ultimate shear strength parameters of older alluvium. The slot cut shall be performed under the full-time observation of TGR. Additional recommendations may be provided based on the exposed field condition.

Trenching

All excavations should conform to CAL-OSHA and local safety codes. Trenches near existing footings shall be in accordance with Section 1089.14 of the 2022 California Building Code.

Utility Trench Backfill

All utility trench backfills in structural areas and beneath hardscape features should be brought to near optimum moisture content and compacted to a minimum relative compaction of ninety (90) percent of the laboratory standard. Flooding/jetting is not recommended.

Sand backfill, (unless trench excavation material), should not be allowed in parallel exterior trenches adjacent to and within an area extending below a 1:1 plane projected from the outside bottom edge of the footing. All trench excavations should minimally conform to CAL-OSHA and local safety codes. Soils generated from utility trench excavations may be used provided it is moisture conditioned and compacted to ninety (90) percent minimum relative compaction.

Drainage

Positive site drainage should be maintained at all times. Water should be directed away from foundations and not allowed to pond and/or seep into the ground. Pad drainage should be directed towards street/parking or other approved area.

Geotechnical Review of Plans

All grading and foundation plans should be reviewed and accepted by the geotechnical consultant prior to construction. If significant time elapses since preparation of this report, the geotechnical consultant should verify the current site conditions, and provide any additional recommendations (if necessary) prior to construction.

Geotechnical Observation/Testing During Construction

Per sections 1705.6 and table 1705.6 of the 2022 California Building Code, periodic geotechnical inspection shall be performed to:

- Verify materials below shallow foundations are adequate to achieve the design bearing capacity;
- Verify excavations are extended to the proper depth and have reached proper material;
- Verify classification and test compacted materials; and
- Prior to placement of compacted fill, inspect subgrade and verify that the site has been prepared properly.

Per sections 1705.6 and table 1705.6 of the 2022 California Building Code, continuous geotechnical inspection shall be performed to:

- Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill.

The geotechnical consultant should also perform observation and/or testing at the following stages:

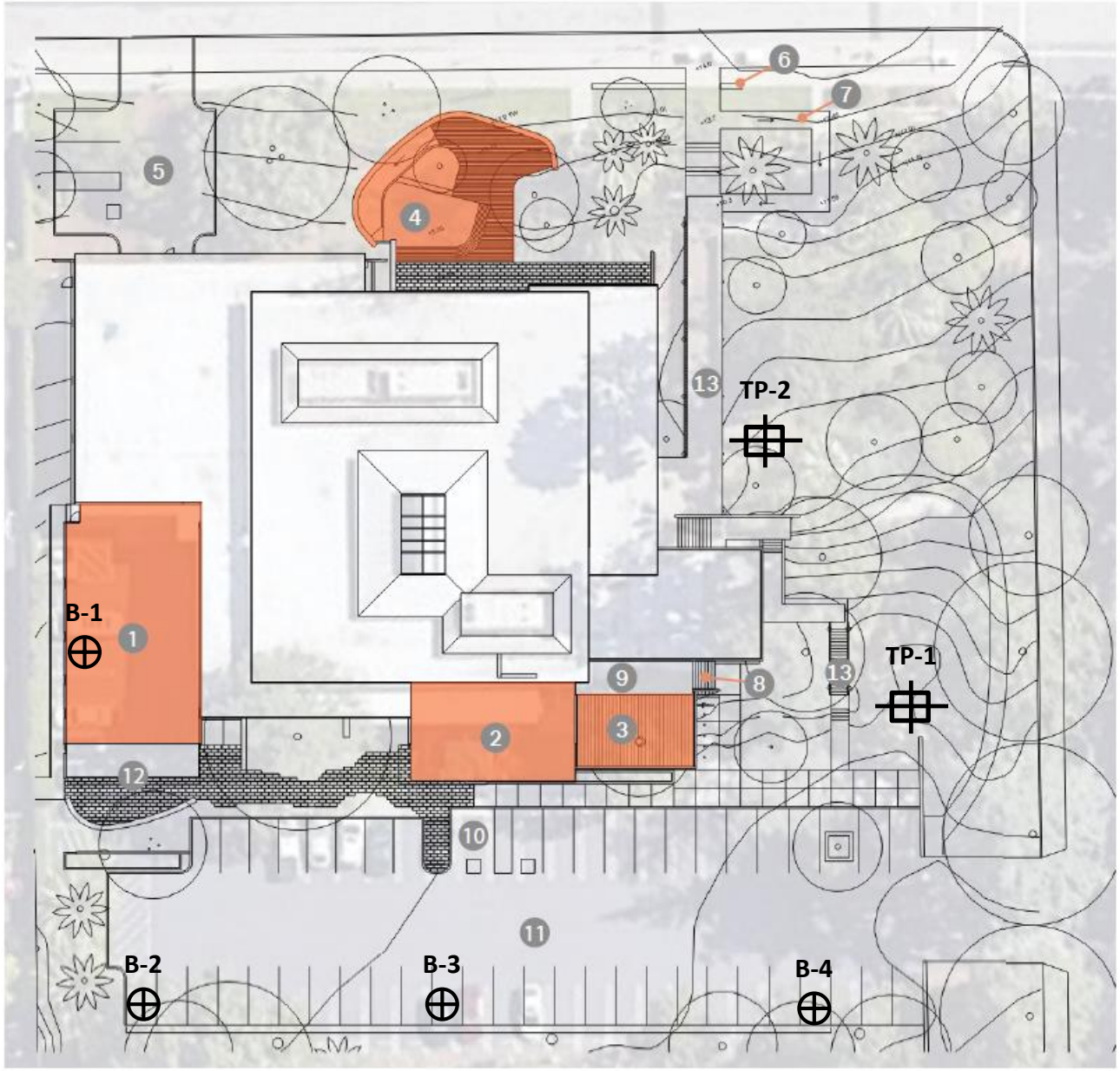
- During any grading and fill placement;
- After foundation excavation and prior to placing concrete;
- Prior to placing slab and flatwork concrete;
- Retaining wall backfill;
- When any unusual soil conditions are encountered during any construction operation subsequent to issuance of this report.

Limitations

This report was prepared for a specific client and a specific project, based on the client's needs, directions and requirements at the time.

This report was necessarily based upon data obtained from a limited number of observances, site visits, soil and/or other samples, tests, analyses, histories of occurrences, spaced subsurface exploration and limited information on historical events and observations. Such information is necessarily incomplete. Variations can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time.

This report is not authorized for use by and is not to be relied upon by any party except the client with whom TGR contracted for the work. Use or reliance on this report by any other party is that party's sole risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify TGR from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of TGR.



B-4 ⊕ APPROXIMATE LOCATION OF EXPLORATORY BORING BYER GEOTECHNICAL (2012)

TP-2 ⊞ APPROXIMATE LOCATION OF EXPLORATORY TEST PIT BYER GEOTECHNICAL (2012)

N

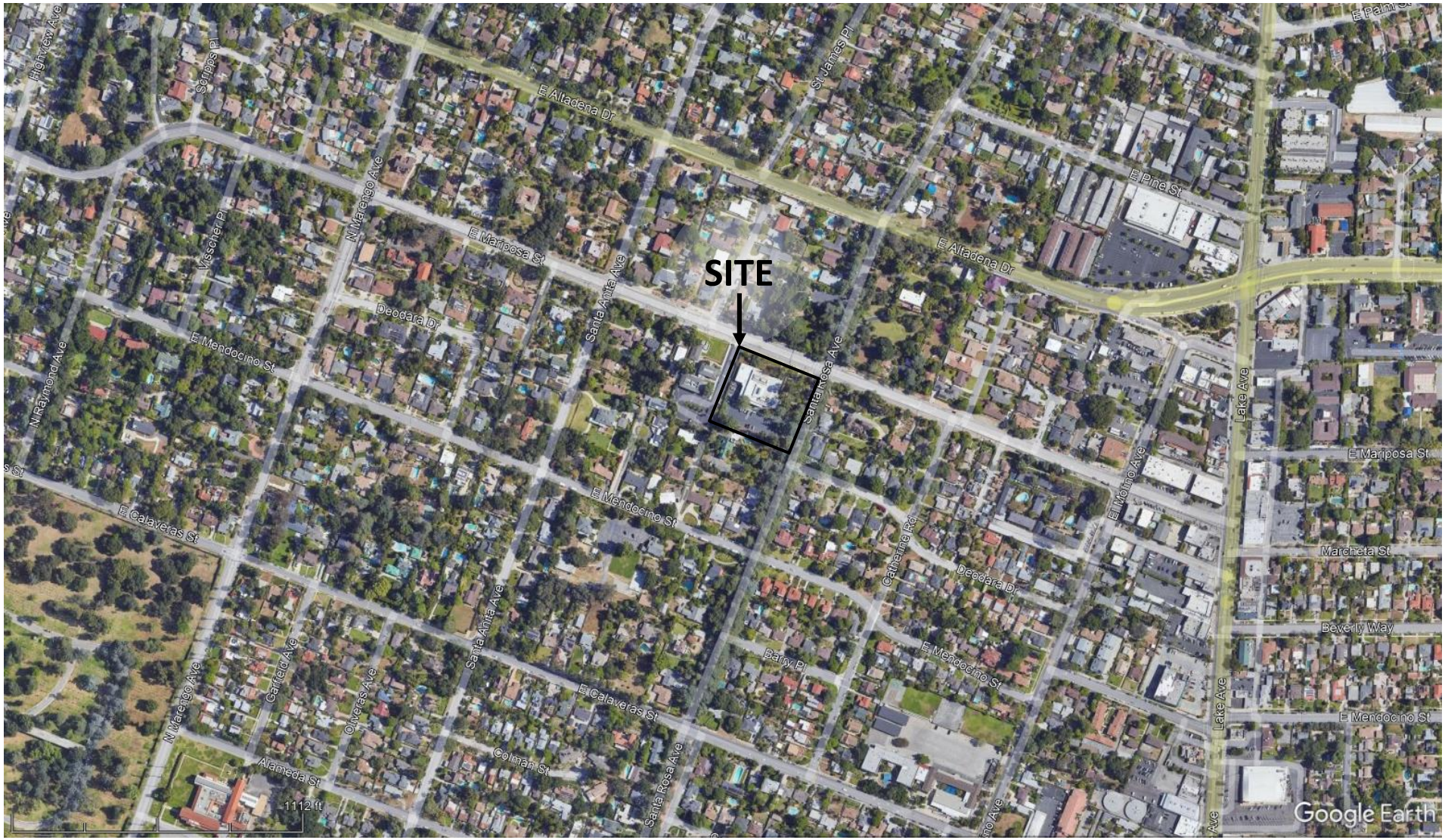
20 15 10 5 0 10 20 40
(IN FEET)

TGR Geotechnical Environmental Hydrogeology Material Testing Construction Inspection

BORING AND TEST PIT LOCATION MAP
ALTADENA LIBRARY
626 EAST MARIPOSA STREET, ALTADENA

PROJECT NO. 23-7751

PLATE 1

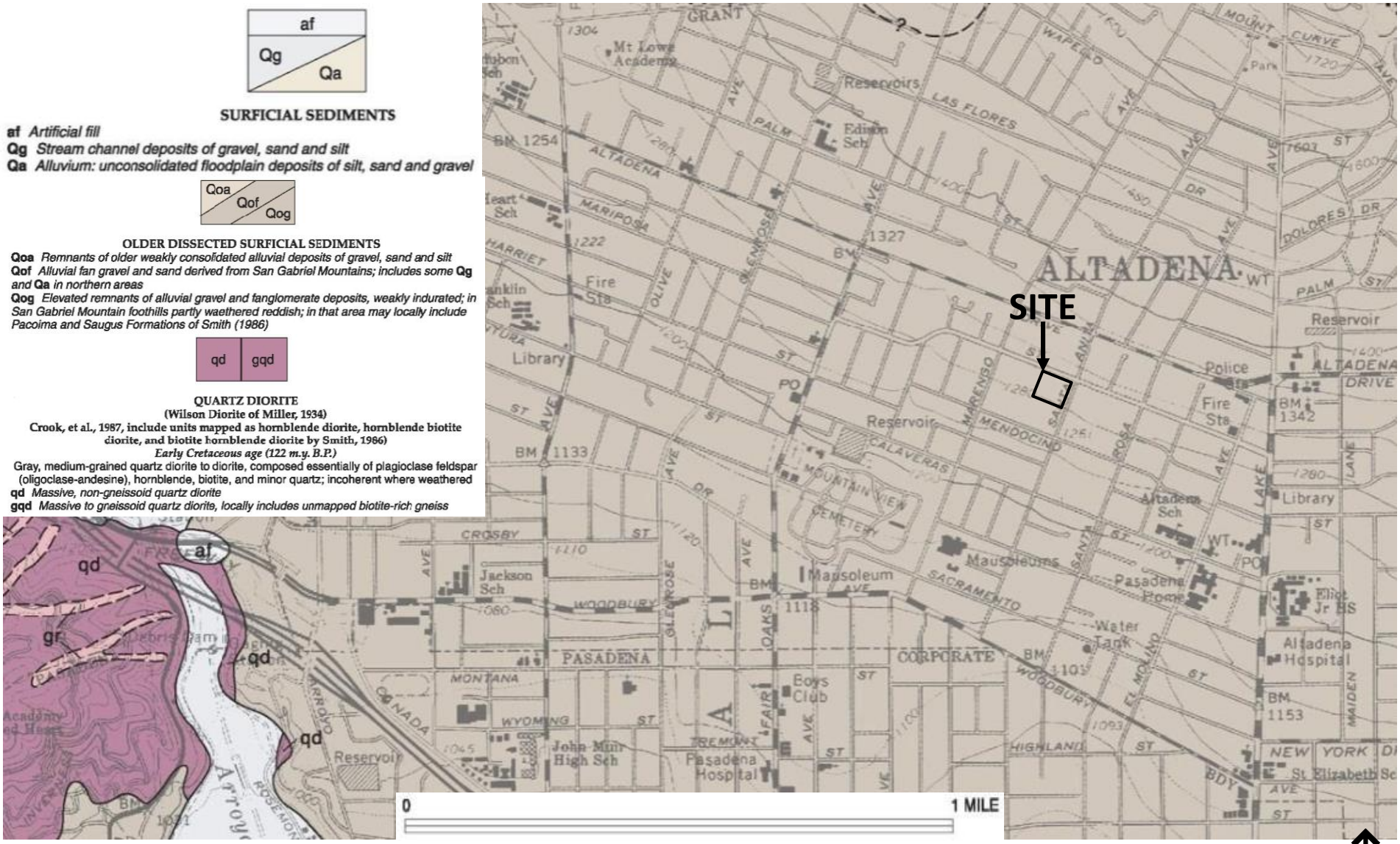


TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

SITE LOCATION MAP
ALTADENA LIBRARY
626 EAST MARIPOSA STREET, ALTADENA

PROJECT NO. 23-7751

FIGURE 1



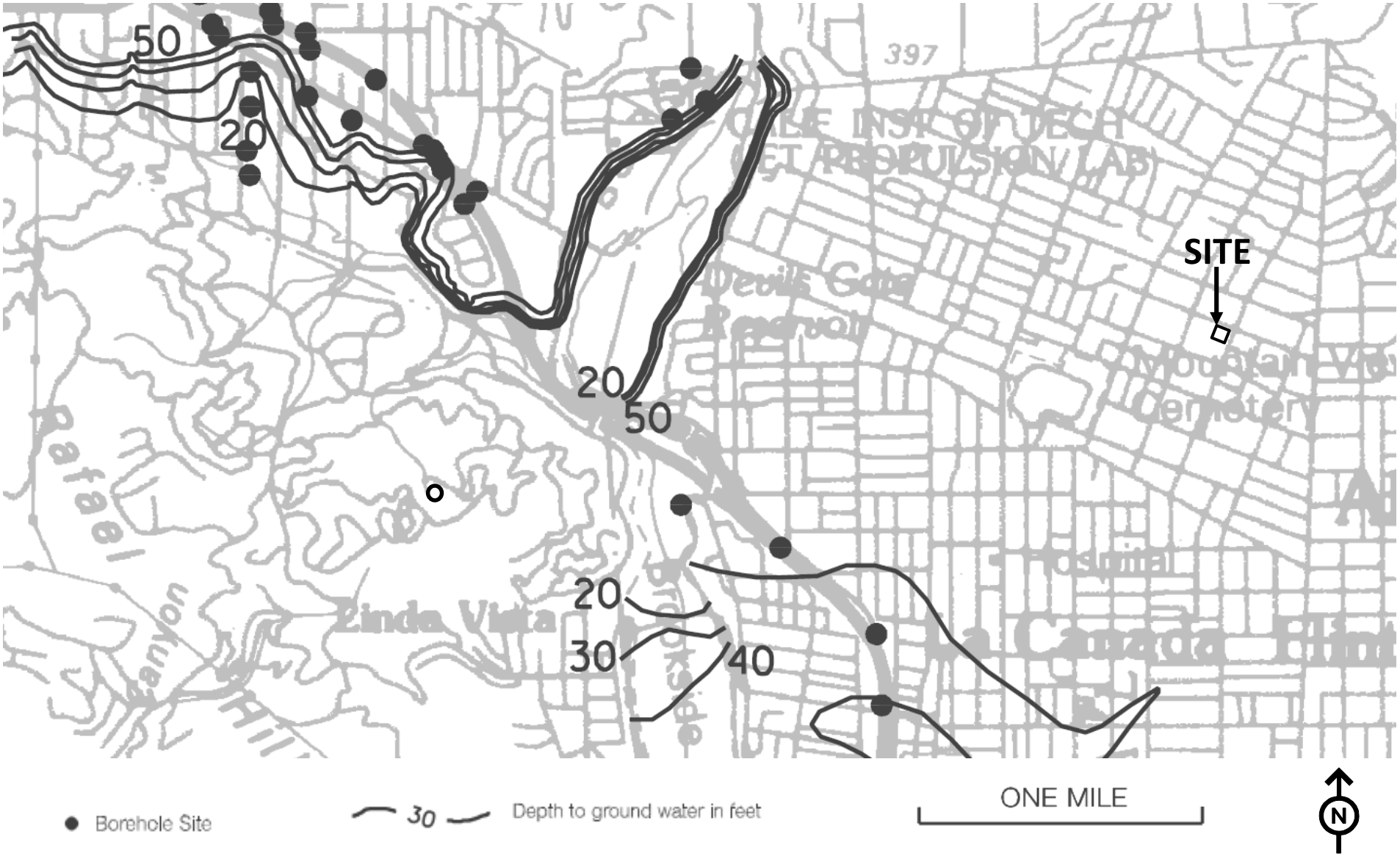
Modified From: Dibblee, T.W., and Ehrenspeck, H.E., ed., 1989, Geologic map of the Pasadena quadrangle, Los Angeles County, California: Dibblee Geological Foundation, DF-23, scale 1:24,000.

TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

REGIONAL GEOLOGY MAP
ALTADENA LIBRARY
626 EAST MARIPOSA STREET, ALTADENA

PROJECT NO. 23-7751

FIGURE 2



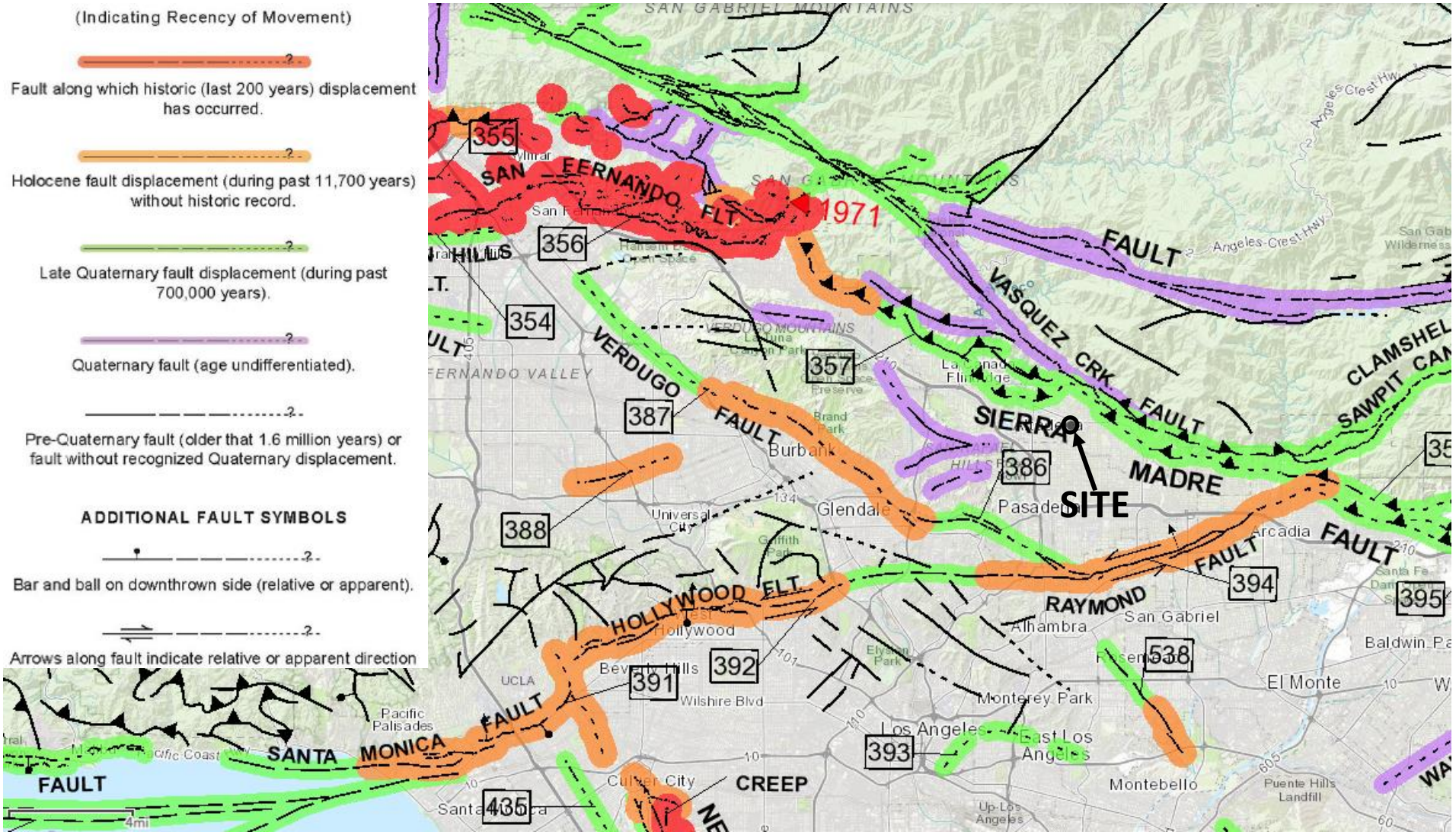
Modified From: California Department of Conservation, Division of Mines and Geology, 1998, Seismic Hazard Zone Report for the Pasadena 7.5-Minute Quadrangle, Los Angeles County California, Report 014.

TGR Geotechnical Environmental Hydrogeology Material Testing Construction Inspection

HISTORIC HIGH GROUNDWATER MAP
ALTADENA LIBRARY
626 EAST MARIPOSA STREET, ALTADENA

PROJECT NO. 23-7751

FIGURE 3



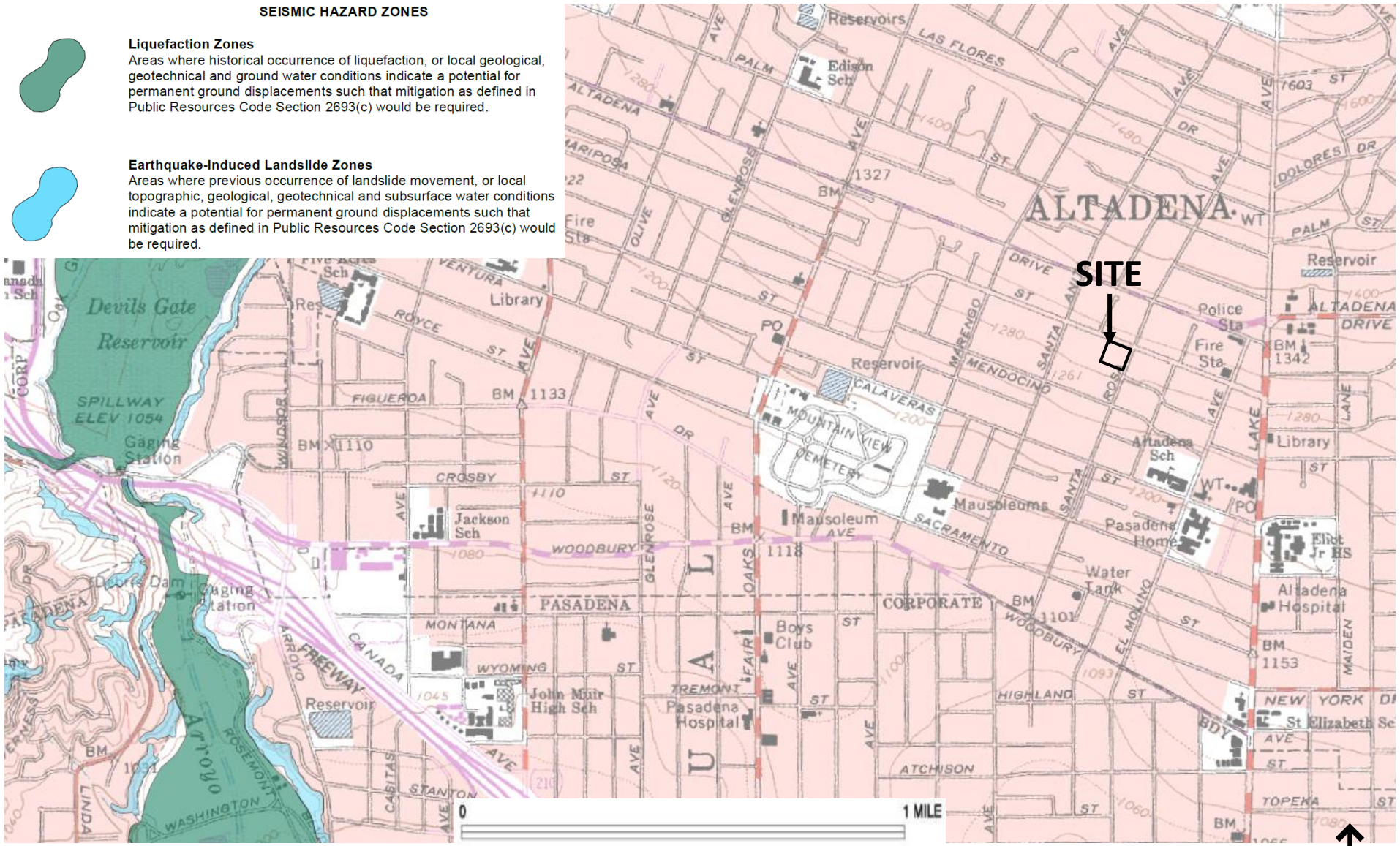
Modified From: Jennings, C. W., 2010, Fault Activity Map of California and Adjacent Areas, California Division of Mines and Geology, Geologic Data Map Series, No. 6, Scale 1:750,000.

TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

REGIONAL FAULT MAP
ALTADENA LIBRARY
626 EAST MARIPOSA STREET, ALTADENA

PROJECT NO. 23-7751

FIGURE 4



Modified From: State of California Division of Mines and Geology, Earthquake Zones of Required Investigation, Pasadena Quadrangle Released March 25, 1999, scale 1:24,000.

TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

SEISMIC HAZARD ZONE MAP
ALTADENA LIBRARY
626 EAST MARIPOSA STREET, ALTADENA

PROJECT NO. 23-7751

FIGURE 5

SLOT CUT CALCULATION

Project No.:	23-7751		
Project Name:	Altadena Library		
Earth Material :	Older Alluvium		
Geometry:			
Height of Slot Cut (H) =	7	feet	
Spacing of slot Cut (S) =	6	feet	
Surcharge (q) =	1000	psf	
Width of Surcharge Assumed (h_a) =	2.5	ft	
Width of Active Edge (h_{max})=	3.5	ft	
Width of Surcharge Used (h) =	2.5	ft	(Minimum of ha and hmax)
Soil Parameters:			
Unit Weight (γ) =	130	pcf	
Cohesion (c) =	300	psf	B-1 (older alluvium Peak)
Friction Angle(ϕ) =	37	degrees	B-1 (older alluvium Peak)
Calculation :			
Critical Dip Angle of Potential Slip Surface (β) =		63.5	degrees
Length of Slip Surface (L) = H/ Cos(90-β) =		7.8218027	ft
Weight of Potential Slip Surface (W) =			
(0.5 x H x H x Tan(90-β) x γ x S) + (q x h x S) =		24527.895	lbs
Sliding Force (SF)= W x Sin(β) =		21950.856	lbs
Resisting Force 1 (RFl) = W x Cos(β) x Tan(ϕ) =		8247.1162	lbs
Resisting Force 2 (RF2) = C x L x S =		14079.245	lbs
Resisting Force 3 (RF3) = C x 0.5 x H x H x Tan(90-β) x 2 =		7329.1496	lbs
Factor of Safety (FS) :			
FS = (RFI + RF2 + RF3) / SF =	1.35	> 1.25	o.k

FIGURE 6

APPENDIX A
REFERENCES

TGR GEOTECHNICAL
DBE, MBE & SBE firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

APPENDIX A

References

Altadena Libraries, 2023, Altadena Library District, Main Library, Schematic Design Package, dated 08 May 2023.

Byer Geotechnical, Inc., 2012, Geotechnical Engineering Exploration, Proposed Addition and Renovation of Altadena Library, Portions of Lots 5, 6, and 7, Block 14, Map 1, Tract, 626 East mariposa Street, Altadena, Unincorporated Los Angeles county, California, dated September 18, 2012.

California Department of Conservation, California Geological Survey, 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners/Developers and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42.

California Department of Conservation, Division of Mines and Geology, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, CDMG Special Publication 117A.

California Department of Conservation, Division of Mines and Geology, 1998, Maps of Known Active Fault Near – Source Zones in California and Adjacent Portions of Nevada.

California Department of Conservation, Division of Mines and Geology, 1998, Seismic Hazard Zone Report for the Pasadena, 7.5-Minute Quadrangle, Los Angeles County California, Report 014.

California Department of Conservation, Division of Mines and Geology, 1999, Earthquake Zones of Required Investigation, Pasadena Quadrangle, Released March 25, 1999, scale 1:24,000.

Dibblee, T.W., and Ehrenspeck, H.E., ed., 1989, Geologic map of the Pasadena quadrangle, Los Angeles County, California: Dibblee Geological Foundation, DF-23, scale 1:24,000.

International Code Council (ICC), California Building Code, 2012 Edition.

Jennings, C. W., 2010, Fault Activity Map of California and Adjacent Areas, California Division of Mines and Geology, Geologic Data Map Series, No. 6, Scale 1:750,000.

APPENDIX B
LOG OF BORINGS AND TEST PITS BY BYER GEOTECHNICAL (2012)

TGR GEOTECHNICAL
DBE, MBE & SBE firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

TGR 20 YEARS ANNIVERSARY

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DRIVE, SUITE 200, GLENDALE, CA 91206
tel 818.549.9959 fax 818.543.3747

LOG OF TEST PITS

CLIENT: CWA AIA, Inc.

ENGINEER: RSB BG: 21566

REPORT DATE: 9/18/12 DATE LOGGED: 7/26/12

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
TEST PIT #1			Surface Conditions: Exposed grade (lawn area)		Elevation: 1,296 Feet
			0 - 1	**FILL:**	Sand with Silt (SP-SM), brown to dark brown, slightly moist, loose to medium dense, fine to medium sand, some coarse sand, rootlets
2 5	2.1 2.4	123.7 120.1	1 - 5.5	**OLDER ALLUVIUM:**	Sand (SP), light brown, slightly moist to dry, dense, fine to medium sand, some coarse sand, abundant granitic rock fragments up to 3" subangular
			End at 5.5 Feet; No Water; No Caving; Fill to 1 Foot.		
TEST PIT #2			Surface Conditions: Exposed grade (lawn area)		Elevation: 1,301 Feet
			0 - 1	**FILL:**	Silty Sand with Gravel (SM), dark brown, slightly moist, loose to medium dense, fine sand, some medium to coarse sand, trace asphalt debris, some small rock fragments, rootlets
2 5	6.1 2.8	98.4 119.6	1 - 5.5	**OLDER ALLUVIUM:**	Sand with Silt and Gravel (SP-SM), brown, slightly moist, medium dense to dense, fine sand, trace medium to coarse sand, fine to coarse gravel up to 1.5" subangular
			End at 5.5 Feet; No Water; No Caving; Fill to 1 Foot.		

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B1

BG No. 21566

PAGE 1 OF 2

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12

PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB

CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1298 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	(SM) Surface: 4 inches asphalt, no base **FILL (Afu):** 0-2.5': Silty SAND, light brown, slightly moist to dry, fine sand, trace medium to coarse sand, some rock fragments.		SM						
1295		(SM) 2.5': TOP: Silty SAND, brown, slightly moist, medium dense to dense, fine sand, trace medium to coarse sand, some rock fragments.		SM SP-SM	Bag1 R1	12 27 43	5.2	122.1	39	Max, EI, Remolded Shear, Remolded Consolidation, Corrosion Suite
	5	(SP-SM) **OLDER ALLUVIUM (Qof):** BOTTOM: SAND with SIlt, brown to dark brown, slightly moist to dry, dense fine sand, trace medium to coarse sand, moderately cemented.		SP-SM	R2	35 33 25	2.7	122.7	21	Direct Shear
1290		(SP-SM) 5': SAND with Silt and Gravel, light brown to brown, slightly moist, dense, fine to medium sand, some coarse sand, fine to coarse gravel up to 1.5 inches subangular, trace rock fragments.		SM SP-SM	R3	15 30 40	8.1	122.9	63	
	10	(SM) 7.5': TOP: Silty SAND, brown, slightly moist, dense, fine sand, trace small rock fragments, moderatley cemented, about 3% porosity. (SP-SM) BOTTOM: SAND with Silt, light brown, slightly moist to dry, dense, fine sand, moderatley cemented, with rock fragments.		SP SP-SM	R4	40 30 28	1.5	127.3	13	
1285		(SP) 10': TOP: SAND, light gray brown to brown, slightly moist to dry, dense, fine sand, trace medium to coarse sand, with granitic rock fragments. (SP-SM) BOTTOM: SAND with Silt, brown, slightly moist to moist, dense, fine sand, small granitic rock fragments.								
	15	(SP) 15': Gravelly SAND, light reddish-brown, slightly moist to dry, very dense, fine to medium sand, some coarse sand, fine to coarse gravel up to 1.5 inches subangular.		SP	R5	48 50/4"	2	114.3	12	Consolidation
1280										
	20	(SP) 20': Gravelly SAND, light reddish-brown, slightly moist to dry, very dense, fine to medium sand, some coarse sand, fine to coarse gravel up to 2 inches subangular.		SP	R6	16 35 50	2.4	121.2	17	Consolidation
1275										
	25									

Bulk Sample Ring Sample

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:54 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B1

BG No. 21566
PAGE 2 OF 2

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12
PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB
CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1298 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SM) 25': Silty SAND, brown, moist, very dense, fine sand, trace small granitic rock fragments, moderately cemented.		SM	R7	18 40 50	8.5	127.2	75	

End at 26.5 Feet; No Groundwater Encountered; Fill to 3 Feet.

Bulk Sample Ring Sample

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:54 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B2

BG No. 21566
PAGE 1 OF 2

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12
PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB
CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1296 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	(SM) Surface: 6 inches asphalt, no base		SM						
1295		**FILL (Afu):** 0-2.5': Silty SAND, brown, slightly moist to dry, fine sand, some medium to coarse sand, with angular rock fragments up to 2 inches.								
		(SM) 2.5': Silty SAND, dark brown, slightly moist, dense, fine sand, trace angular rock fragments up to 1.5 inches, some brick debris.		SM	R1	32 50/5"	5.8	122.8	44	
	5									
1290		(SM) 5': Silty SAND, dark brown, slightly moist, medium dense, fine sand, trace medium to coarse sand, trace asphalt and brick debris.		SM	R2	25 22 20	6.4	121.2	46	
		(SM) **OLDER ALLUVIUM (Qof):**		SM						
		(SM) 7.5': Silty SAND, brown, slightly moist, medium dense, fine sand, trace small rock fragments, moderatley cemented.		SM	R3	5 10 16	6.4	113.1	37	Direct Shear, Consolidation
	10									
1285		(SP-SM) 10': SAND with Silt, light brown to brown, slightly moist to dry, medium dense, fine sand, trace small rock fragments, moderately cemented.		SP-SM	R4	7 10 20	6.1	116.3	38	
	15									
1280		(SP-SM) 15': SAND with Silt and Gravel, light brown, slightly moist to dry, dense, fine sand, trace medium to coarse sand, fine to coarse gravel up to 1.5 inches subangular.		SP-SM	R5	15 28 35	4.5	115.1	28	
	20									
1275		(SP) 20': Gravelly SAND, light reddish-brown to tan, slightly moist to dry, dense to very dense, fine sand, trace medium to coarse sand, fine to coarse gravel up to 2 inches subangular.		SP	R6	50/3"				
	25									

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:54 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

Ring Sample

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B2

BG No. 21566
PAGE 2 OF 2

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12
PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB
CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1296 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SP) 25': Gravelly SAND, light reddish-brown, slightly moist to dry, dense to very dense, fine sand, trace medium to coarse sand, fine to coarse gravel up to 2 inches subangular.		SP	R7	50				

End at 25.5 Feet; No Groundwater Encountered; Fill to 7 Feet.

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:54 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

Ring Sample

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B3

BG No. 21566
PAGE 1 OF 2

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12
PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB
CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1295 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
1295	0	(SM) Surface: 3 inches asphalt, no base **FILL (Afu):** 0-2.5': Silty SAND, brown, slightly moist to dry, fine sand, trace medium to coarse sand, trace small rock fragments.		SM						
1290	5	(SM) 2.5': Silty SAND, dark brown, slightly moist to dry, dense, fine sand, some medium to coarse sand, moderately cemented.		SM	R1	26 50/5"	5.9	127	52	
		(SM) 5': Silty SAND, brown, slightly moist, medium dense, fine sand, trace medium to coarse sand, trace concrete debris.		SM	R2	18 15 10	5.8	118.5	39	
1285	10	(SP-SM) **OLDER ALLUVIUM (Qof):** (SP-SM) 7.5': SAND with Silt, brown to dark brown, slightly moist, medium dense, fine sand, moderatley cemented.		SP-SM SP-SM	R3	8 9 18	4.7	115.9	29	Direct Shear
1280	15	(SP-SM) 10': SAND with Silt, brown, slightly moist, medium dense, fine sand, trace medium to coarse sand, moderately cemented.		SP-SM	R4	9 15 18	3.9	118.1	26	Consolidation
1275	20	(SW) 15': Gravelly SAND, light reddish-brown, slightly moist to dry, dense, fine to coarse sand, fine to coarse gravel up to 1.5 inches subangular.		SW	R5	15 34 38	2	119.5	14	
1270	25	(SW) 20': Gravelly SAND, light reddish-brown, slightly moist to dry, dense to very dense, fine to coarse sand, fine to coarse gravel up to 3 inches subangular, weakly cemented.		SW	R6	24 50	1.9	121.8	14	

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:55 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

Ring Sample

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B3

BG No. 21566
PAGE 2 OF 2

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12
PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB
CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1295 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
1270	25	(SP) 25': SAND, light greenish-brown, slightly moist, very dense, fine sand, some granitic rock fragments up to 2 inches subangular, trace fines, moderately cemented.		SP	R7	27 40 50	3.7	124.2	30	Consolidation
1265	30	(SP) 30': SAND, light greenish-brown, slightly moist, very dense, fine sand, fine gravel up to 3/4 inch subangular, trace small granitic rock fragments, trace fines.		SP	R8	50	4.9	112.1	27	

End at 30.5 Feet; No Groundwater Encountered; Fill to 7 Feet.

Ring Sample

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:55 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B4

BG No. 21566
PAGE 1 OF 1

CLIENT CWA AIA, Inc. **REPORT DATE** 9/18/12 **DRILL DATE** 7/26/12
PROJECT LOCATION 626 East Mariposa Street, Altadena, CA **LOGGED BY** RSB
CONTRACTOR Choice Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 1294 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	(SM) Surface: 4 inches asphalt, no base **FILL (Afu):** 0-2.5': Silty SAND, dark brown, slightly moist to dry, fine sand, trace medium to coarse sand, some fine gravel up to 1/2 inch subangular, trace small rock fragments.		SM						
1290		(SM) 2.5': Silty SAND, dark brown, slightly moist to dry, medium dense, fine sand, trace medium to coarse sand, some small rock fragments.		SM	R1	9 10 10	6.8	112.9	39	
	5	(SP-SM) 5': SAND with Silt, brown, slightly moist to dry, medium dense, fine sand, trace medium to coarse sand, trace concrete debris.		SP-SM	R2	9 19 22	3.8	117.1	25	
1285		(SP-SM) **OLDER ALLUVIUM (Qof):** (SP-SM) 7.5': SAND with Silt, light brown, slightly moist to dry, dense, fine sand, trace medium to coarse sand, trace small granitic rock fragments,		SP-SM SP-SM	R3	13 23 27	4.7	123.8	37	
	10	(SP) 10': SAND, light reddish-brown, slightly moist to dry, medium dense, fine sand, trace medium to coarse sand, trace granitic rock fragments.		SP	R4	15 13 17	3.1	118.6	21	Direct Shear
1280										
	15	(SW) 15': Gravelly SAND, light reddish-brown, slightly moist to dry, very dense, fine to coarse sand, fine to coarse gravel up to 2 inches subangular.		SW	R5	35 38 50/3"	5.6	111.1	31	Consolidation
1275										
	20	(SW) 20': Gravelly SAND, light reddish-brown, slightly moist to dry, very dense, fine to coarse sand, fine to coarse gravel up to 1.5 inches subangular.		SW	R6	27 50	2	116.2	13	

End at 21 Feet; No Groundwater Encountered; Fill to 7 Feet.

Ring Sample

BUCKET AUGER BORING LOG BY RSB - GINT STD US BYER.GDT - 9/18/12 15:55 - P:\21000 - 21999\21566 CWA ALTADENA LIBRARY ADDITIONS\21566 BORING LOGS.GPJ

APPENDIX C
LABORATORY TEST RESULTS BY BYER GEOTECHNICAL (2012)

TGR GEOTECHNICAL
DBE, MBE & SBE firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

TGR 20 YEARS ANNIVERSARY

September 18, 2012
BG 21566

LABORATORY TESTING

Undisturbed and bulk samples of the existing fill and older alluvium were obtained from the test pits and borings and transported to the laboratory for testing and analysis. The samples were obtained by driving a ring-lined, barrel sampler conforming to ASTM D 3550-01 with successive drops of the sampler. Experience has shown that sampling causes some disturbance of the sample. However, the test results remain within a reasonable range. The samples were retained in brass rings of 2.50 inches outside diameter and 1.00 inches in height. The samples were stored in close fitting, waterproof containers for transportation to the laboratory.

Moisture-Density

The dry density of the samples was determined using the procedures outlined in ASTM D 2937-10. The moisture content of the samples was determined using the procedures outlined in ASTM D 2216-10. The results are shown on the enclosed Log of Test Pits and Log of Borings.

Maximum Density

The maximum dry density and optimum moisture content of the future compacted fill were determined using the procedures outlined in ASTM D 1557-12, a five-layer standard. Remolded samples were prepared at 90 percent of the maximum dry density. The remolded samples were tested for shear strength.

Boring	Depth (Feet)	Earth Material	Soil Type and Color	Maximum Density (pcf)	Optimum Moisture %	Expansion Index
1	0 - 5	Fill/ Older Alluvium	Silty Sand, Brown	131.0	10.0	13 - Very Low

Expansion Test

To find the expansiveness of the soil, a swell test was performed using the procedures outlined in ASTM D 4829-11. Based upon the testing, soils exposed at finish grade are expected to exhibit a very low expansion potential.

LABORATORY TESTING (Continued)

Shear Tests

Shear tests were performed on samples of future compacted fill and older alluvium using the procedures outlined in ASTM D 3080-11 and a strain controlled, direct-shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 inches per minute. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the enclosed Shear Test Diagrams.

Consolidation

Consolidation tests were performed on *in situ* samples of future compacted fill and older alluvium using the procedures outlined in ASTM D 2435-11. Results are graphed on the enclosed Consolidation Curves.

Corrosion

A representative sample of the near-surface soil was transported to Environmental Geotechnology Laboratory for chemical testing. The testing was performed in accordance with Caltrans Standards 643 (pH), 422 (Chloride Content), 417 (Sulfate Content), and 532 (Resistivity). The results of the testing are reported in the following table:

CHEMICAL TEST RESULTS TABLE

Sample	Depth (Feet)	pH	Chloride (PPM)	Sulfate (%)	Resistivity (Ohm-cm)
B1- Bag1	0 - 5	7.53	75	0.001	7,000

The chloride and sulfate contents of the soil are negligible and not a factor in corrosion. The pH is near neutral and not a factor. The resistivity indicates that the soil is considered moderately corrosive to ferrous metals.

September 18, 2012
BG 21566

APPENDIX

Laboratory Testing and Field Exploration

BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

SHEAR TEST DIAGRAM #1

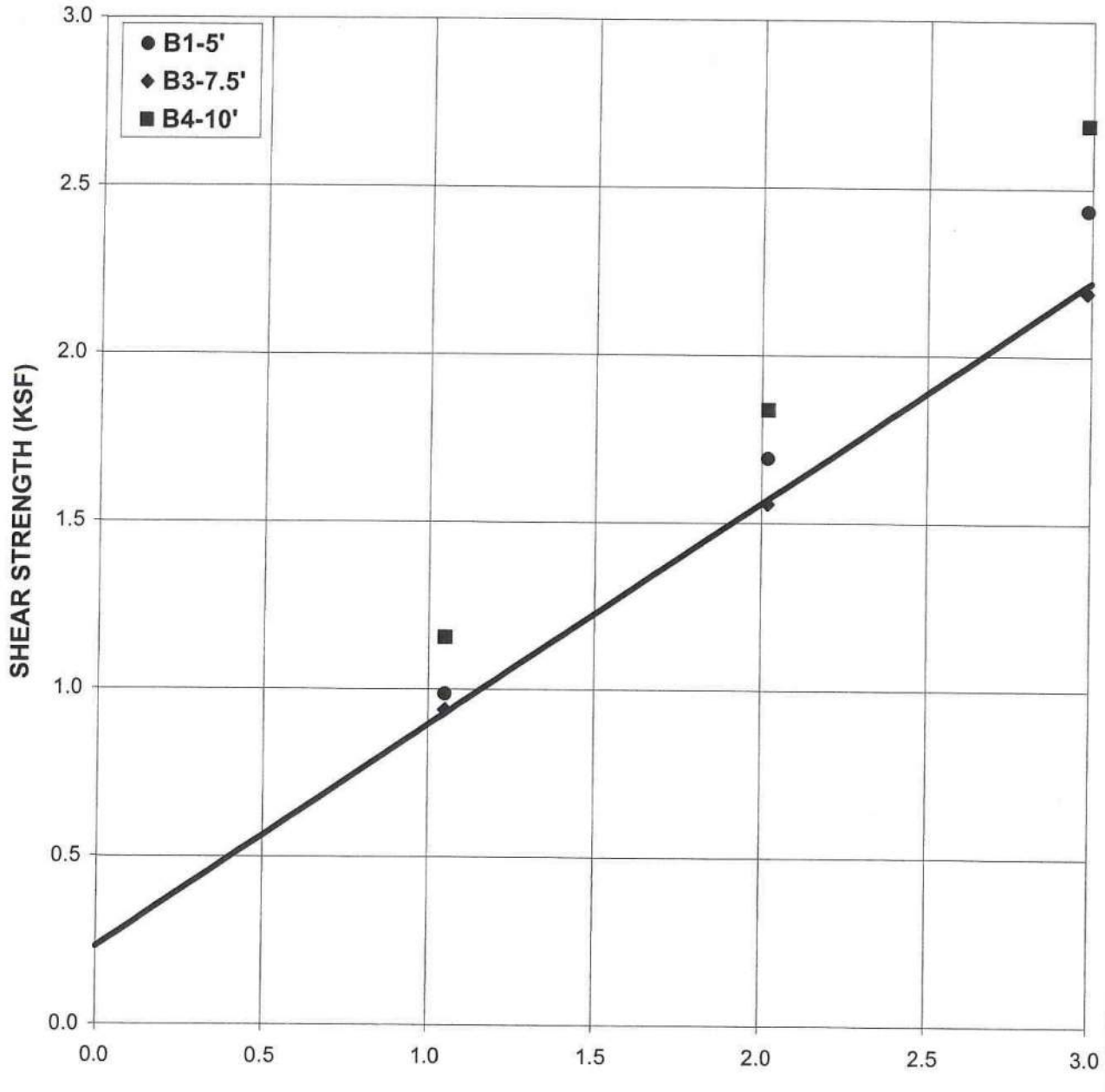
BG: 21566 ENGINEER: RSB
CLIENT: CWA AIA, Inc.

EARTH MATERIAL: Older Alluvium

Phi Angle = 34 degrees
Cohesion = 230 psf

Average Moisture Content	15.1%
Average Dry Density (pcf)	119.1
Average Percent Saturation	100%

DIRECT SHEAR TEST - ASTM D-3080 (ULTIMATE VALUES)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

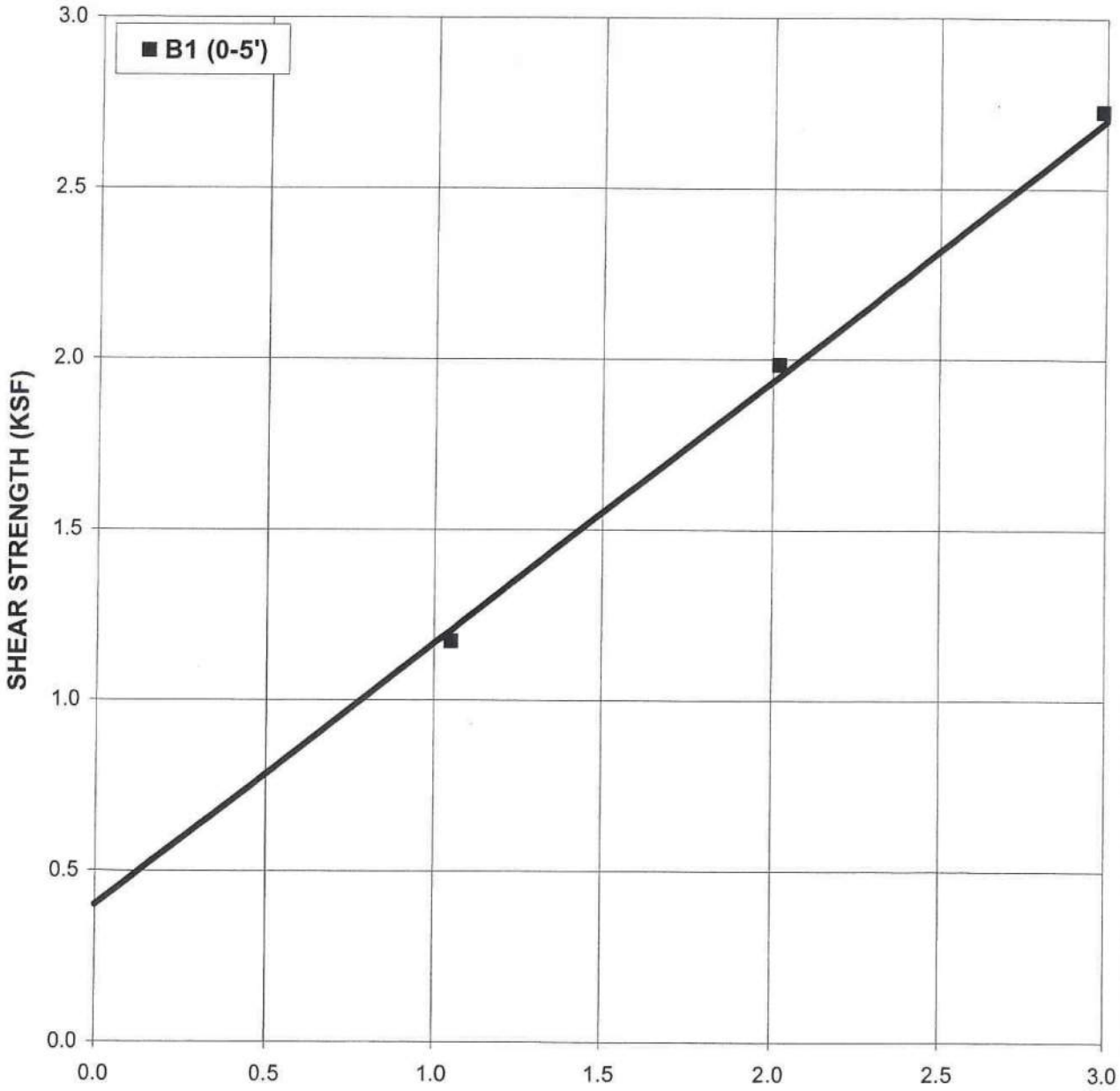
SHEAR TEST DIAGRAM #2

BG: **21566** ENGINEER: **RSB**
CLIENT: **CWA AIA, Inc.**

EARTH MATERIAL: **Future Compacted Fill (Remolded to 90%)**

Phi Angle =	**37 degrees**	**Moisture Content**	**15.2%**
Cohesion =	**400 psf**	**Dry Density (pcf)**	**117.9**
		Percent Saturation	**97%**

DIRECT SHEAR TEST - ASTM D-3080 (ULTIMATE VALUES)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

CONSOLIDATION CURVE #1

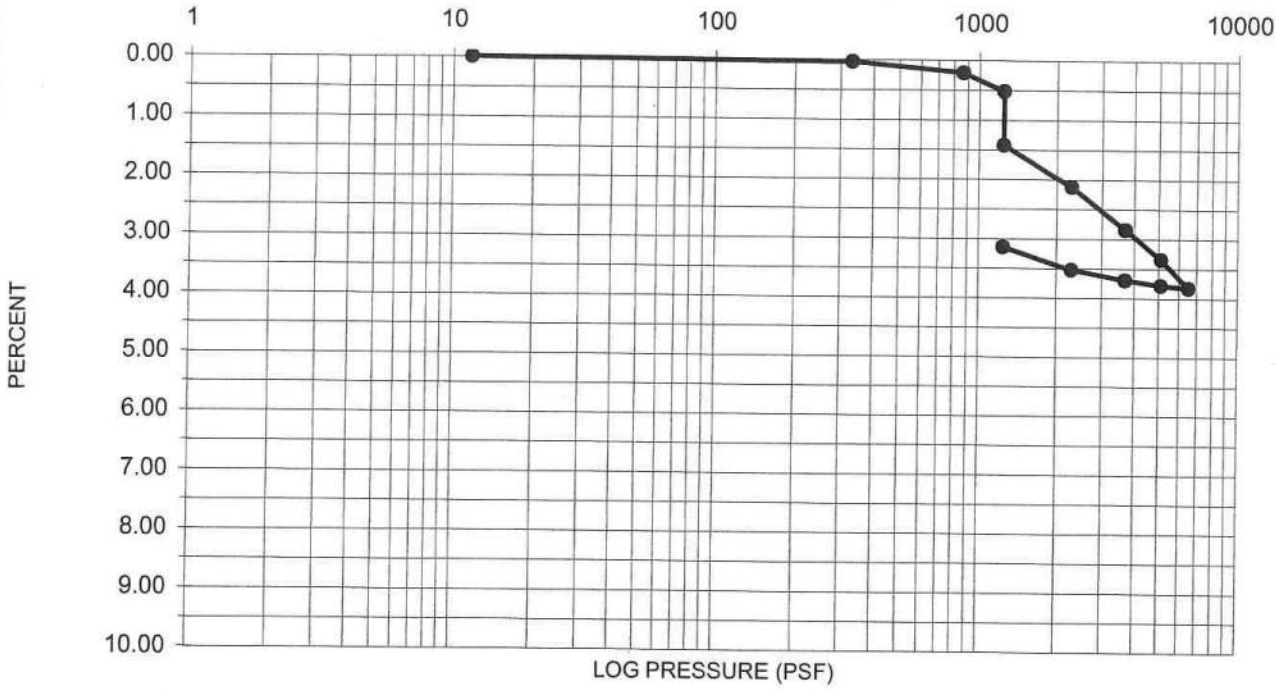
BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Older Alluvium
Sample Location:	B2-7.5'
Dry Weight (pcf):	113.2
Initial Moisture:	6.4%
Initial Saturation:	35.9%
Water Added at (psf)	1237

Specific Gravity:	2.68
Initial Void Ratio:	0.48
Compression Index (Cc):	0.067
Recompression Index (Cr):	0.021

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

CONSOLIDATION CURVE #2

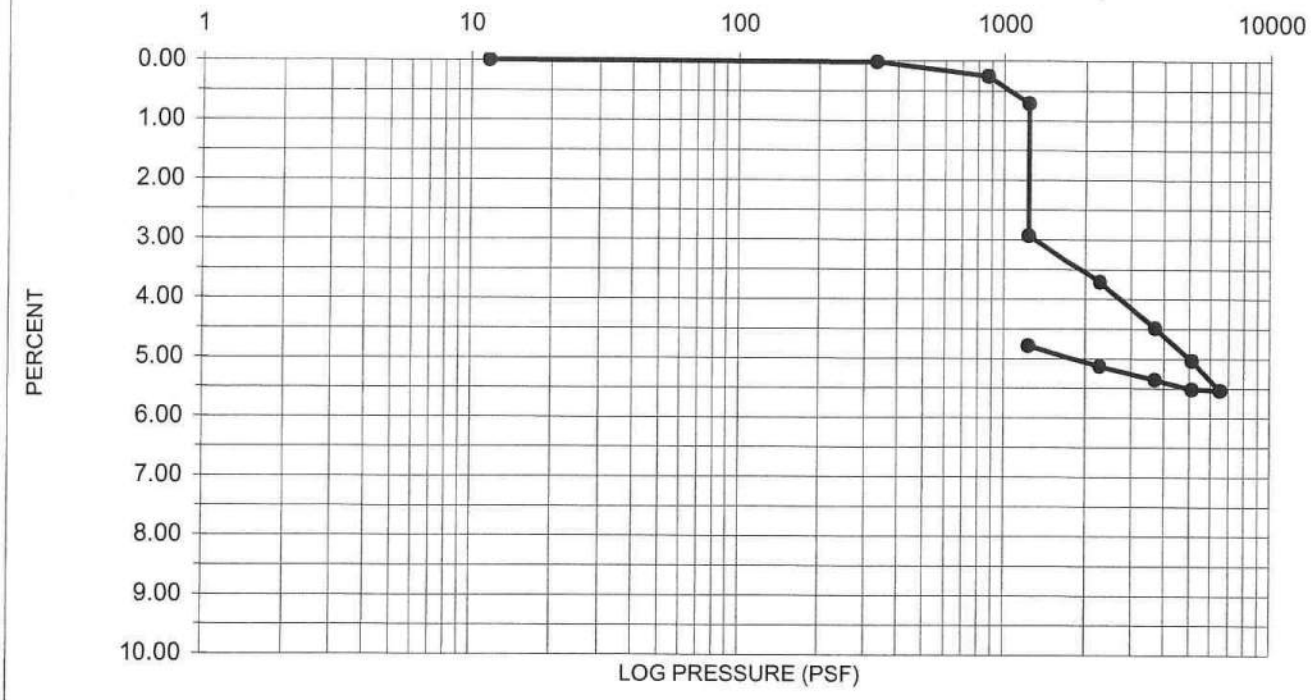
BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Older Alluvium
Sample Location:	B3-10'
Dry Weight (pcf):	118.1
Initial Moisture:	3.9%
Initial Saturation:	25.1%
Water Added at (psf)	1237

Specific Gravity:	2.68
Initial Void Ratio:	0.42
Compression Index (Cc):	0.066
Recompression Index (Cr):	0.019

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

CONSOLIDATION CURVE #3

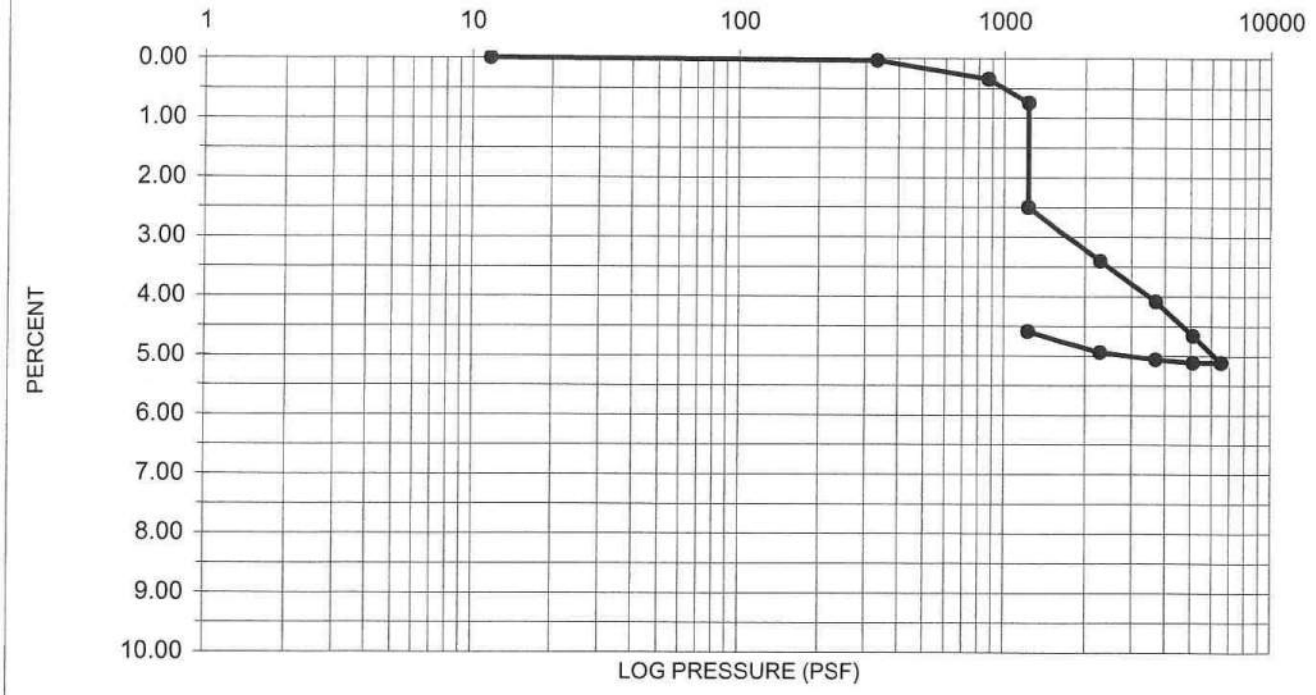
BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Older Alluvium
Sample Location:	B1-15'
Dry Weight (pcf):	114.3
Initial Moisture:	2.0%
Initial Saturation:	11.6%
Water Added at (psf)	1237

Specific Gravity:	2.68
Initial Void Ratio:	0.46
Compression Index (Cc):	0.062
Recompression Index (Cr):	0.019

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

CONSOLIDATION CURVE #4

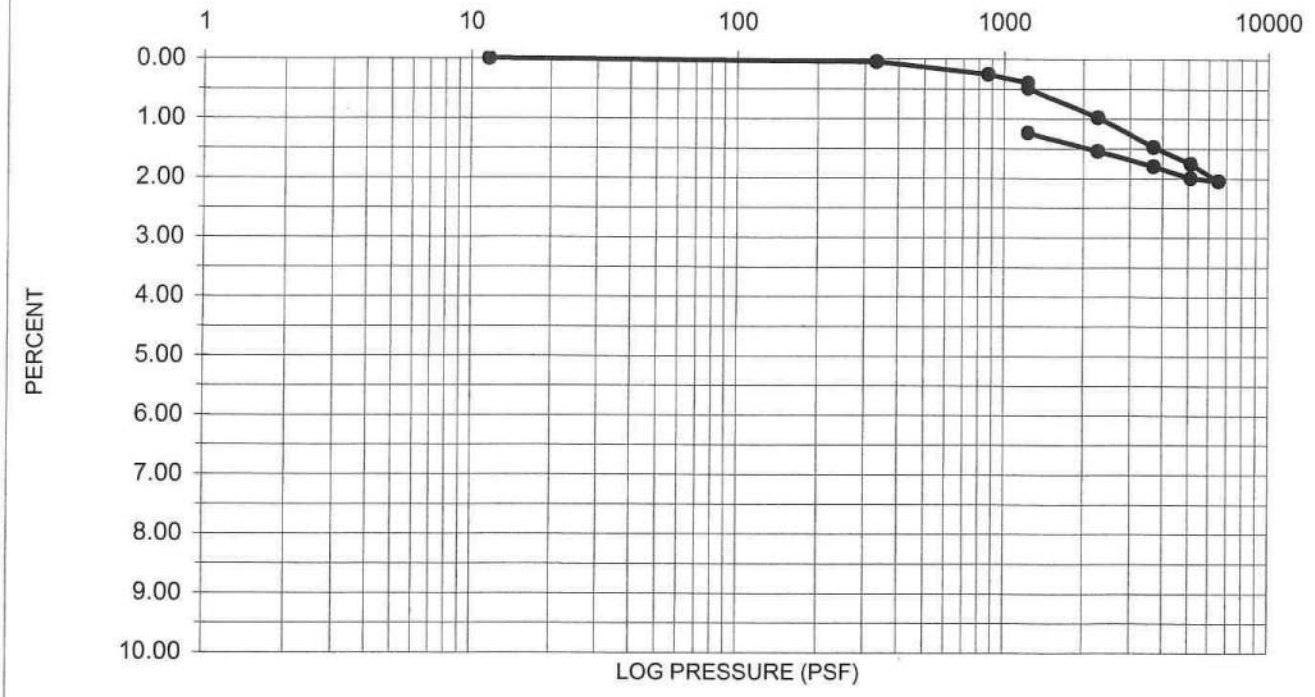
BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Older Alluvium
Sample Location:	B4-15'
Dry Weight (pcf):	111.1
Initial Moisture:	5.6%
Initial Saturation:	29.7%
Water Added at (psf)	1237

Specific Gravity:	2.68
Initial Void Ratio:	0.50
Compression Index (Cc):	0.041
Recompression Index (Cr):	0.021

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

CONSOLIDATION CURVE #5

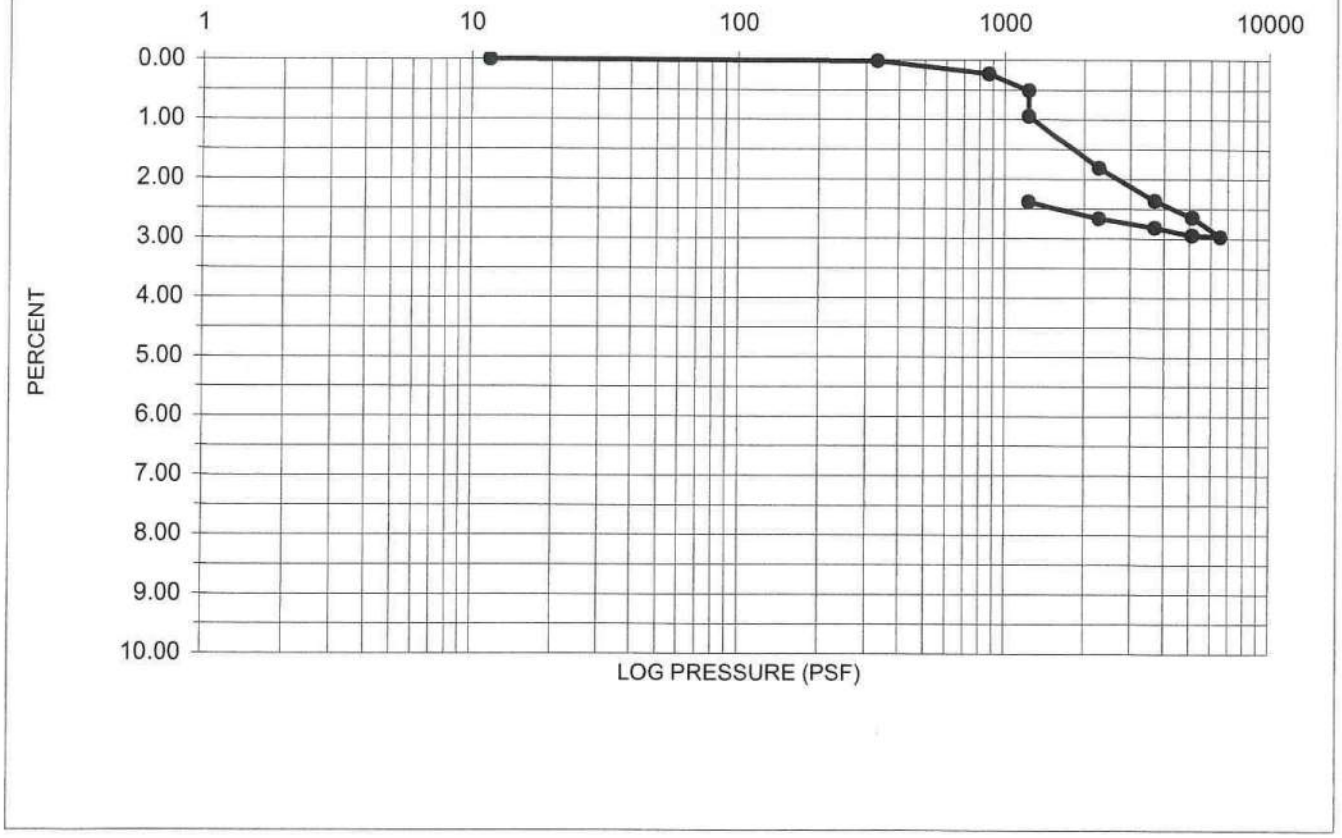
BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Older Alluvium
Sample Location:	B1-20'
Dry Weight (pcf):	121.2
Initial Moisture:	2.4%
Initial Saturation:	16.9%
Water Added at (psf)	1237

Specific Gravity:	2.68
Initial Void Ratio:	0.38
Compression Index (Cc):	0.045
Recompression Index (Cr):	0.015

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

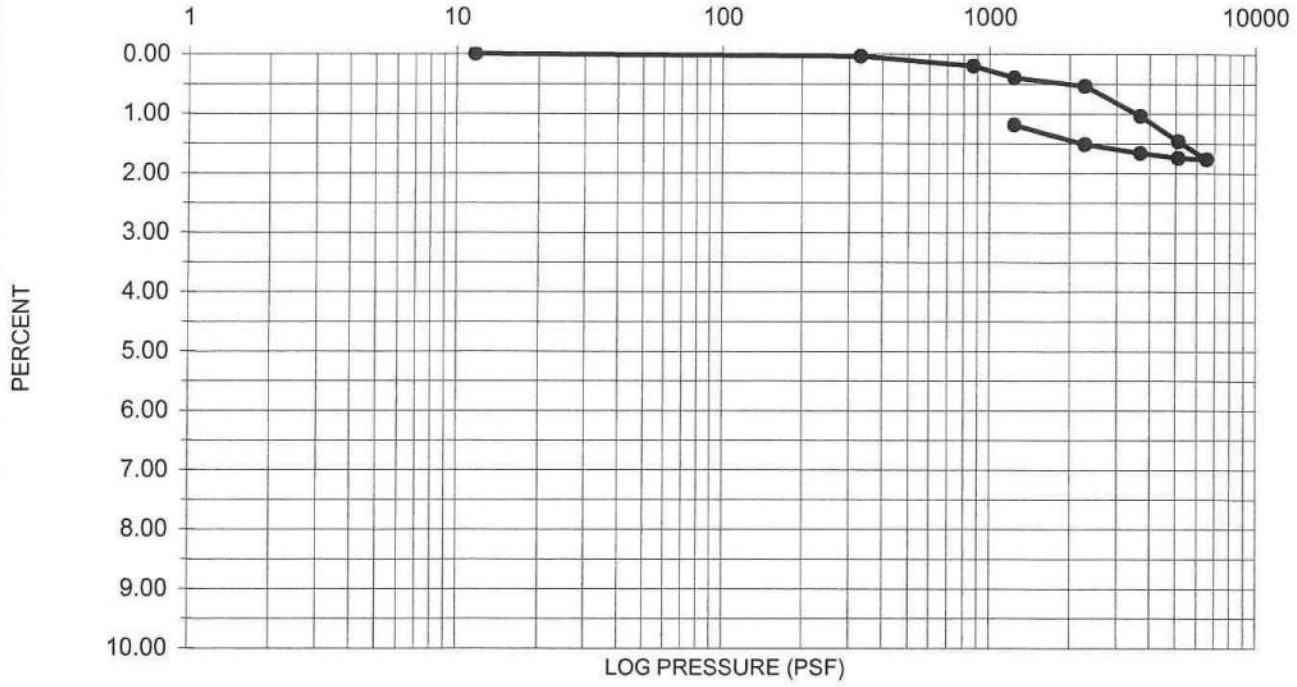
CONSOLIDATION CURVE #6

BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Older Alluvium		
Sample Location:	B3-25'	Specific Gravity:	2.68
Dry Weight (pcf):	124.2	Initial Void Ratio:	0.35
Initial Moisture:	3.7%	Compression Index (Cc):	0.041
Initial Saturation:	28.6%	Recompression Index (Cr):	0.017
Water Added at (psf)	1237		

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

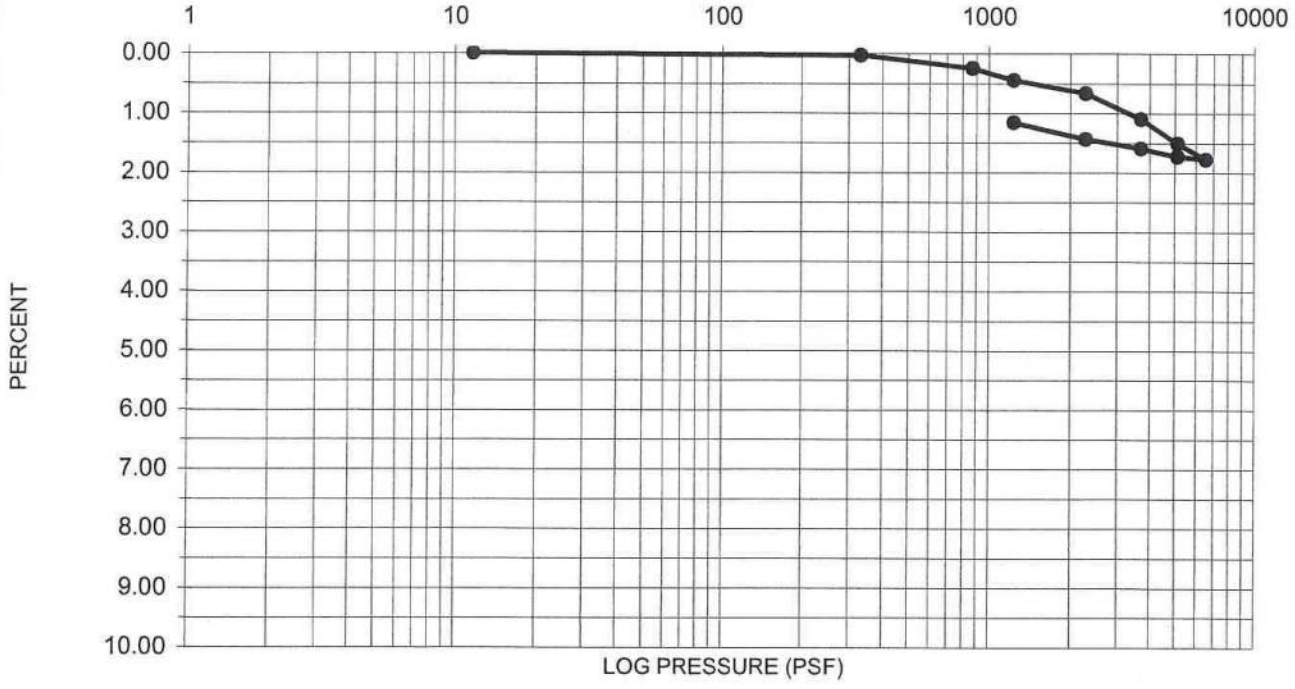
CONSOLIDATION CURVE #7

BG: **21566** ENGINEER: **RSB**

CLIENT: **CWA AIA, Inc.**

Earth Material:	Future Compacted Fill (Remolded to 90%)		
Sample Location:	B1 (0-5')	Specific Gravity:	2.68
Dry Weight (pcf):	117.9	Initial Void Ratio:	0.42
Initial Moisture:	10.0%	Compression Index (Cc):	0.041
Initial Saturation:	64.1%	Recompression Index (Cr):	0.015
Water Added at (psf)	1237		

CONSOLIDATION DIAGRAM (ASTM D 2435-04)



APPENDIX D
SITE SEISMIC DESIGN PARAMETERS

TGR GEOTECHNICAL
DBE, MBE & SBE firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

TGR 20 YEARS ANNIVERSARY

Altadena Library

Latitude, Longitude: 34.1891, -118.1371



Date	7/10/2023, 2:53:25 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.924	MCE_R ground motion. (for 0.2 second period)
S_1	0.721	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.924	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.283	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.83	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.913	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.924	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.139	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.394	Factored deterministic acceleration value. (0.2 second)
S1RT	0.721	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.803	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.777	Factored deterministic acceleration value. (1.0 second)
PGAd	0.967	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.83	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.899	Mapped value of the risk coefficient at short periods
C_{R1}	0.898	Mapped value of the risk coefficient at a period of 1 s
C_V	1.485	Vertical coefficient

DISCLAIMER

While the information presented on this website is believed to be correct, SEAOC /OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this website.

PART 5: UNDERGROUND UTILITY SURVEY

NOTE: MEASUREMENTS SHOWN ARE NOT SURVEY GRADE.
DEPTHS AND LOCATIONS ARE APPROXIMATE.

Elevations:
Elevations are based on California State Plane V and the elipsoid elevation of 1901.46; feet at the Tack&Tag on the curb at the Wester'ly property corner.

Utility Legend

ELECTRICAL — E — E — E — E —
ELECTRICAL_2 — E — — — — —
GAS — GAS — GAS — GAS — GAS —
GAS_2 — GAS — — — — —
IRRIGATION — IRR — IRR — IRR — IRR —
IRRIGATION_2 — IRR — — — —
SEWER — S — S —
SEWER_2 — S — — — — —
TEL — TEL — TEL — TEL — TEL —
TEL_2 — TEL — — — — —
WATER — W — W — W — W —
WATER_2 — W — W —
WATER_3 — W — — — —

St. James Place

FD Spk&Washer
Elevation 1314.17

Mariposa Street

N 68°34'30" W
447.79'

45'

40'

N 68°34'30" W 266.25'

N 21°13'42" E
282.03'

N 21°12'30" W
295.00'

N 21°12'30" E
375.00'

37.5'

37.5'

Irrigation
2'-3" Deep

Irrigation
2'-4" Deep

Telecomm
3'-9" Deep

Electrical
3'-9" Deep

Electrical
1'-2" Deep

Electrical
1'-2" Deep

Electrical
1'-8" Deep

Water Line
3'-2" Deep

Gas
3'-6" Deep

Sewer
4'-5" Deep

Electrical
1'-6" Deep

Storm drain from French drain south under cement pad and drains into grass area 4 inch white PVC pipe 2'-1"deep

Telecom and fiber optics in one 2.5 inch steel pipe to building MPOE

Electric 4" PVC Primary from pole to Pad Mount at 4'-10" deep

Electric STL pipe 1'-8" deep feeds Parking lot lights

Irrigation electric from building feeding Irrigation PVC pipe 1'-8" depth

Telecom ends at service panel inside building @MPOE

Storm drain Signal end

2 one inch STL electric lines @0'-10" depth feeding bridge lights, tree lights and pathway lights

3 STL pipe electric lines feeding bridge lights and Tree lights @0'-10" depth

1 inch STL pipe feeding gate motor to parking lot light @ 1'-6" Depth

Electric feeding tree lights @ 1'-8"steel pipe

Electric feeding tree lights @ 0'-10" steel pipe

Gas- only 1 90 degree elbow to building service riser in this location to main POC 2 inch STL line

Storm drain outlet in this area to building @ 2'-10" depth clay pipe

1 One inch Steel electrical pipe @ 1'-6" Depth to Bridge lights

Storm Drain Pipes are both collapsed and or have a blockage refer to Photos

Building Area = 17,362 sq.ft.
Lot Area = 75,124 sq.ft.

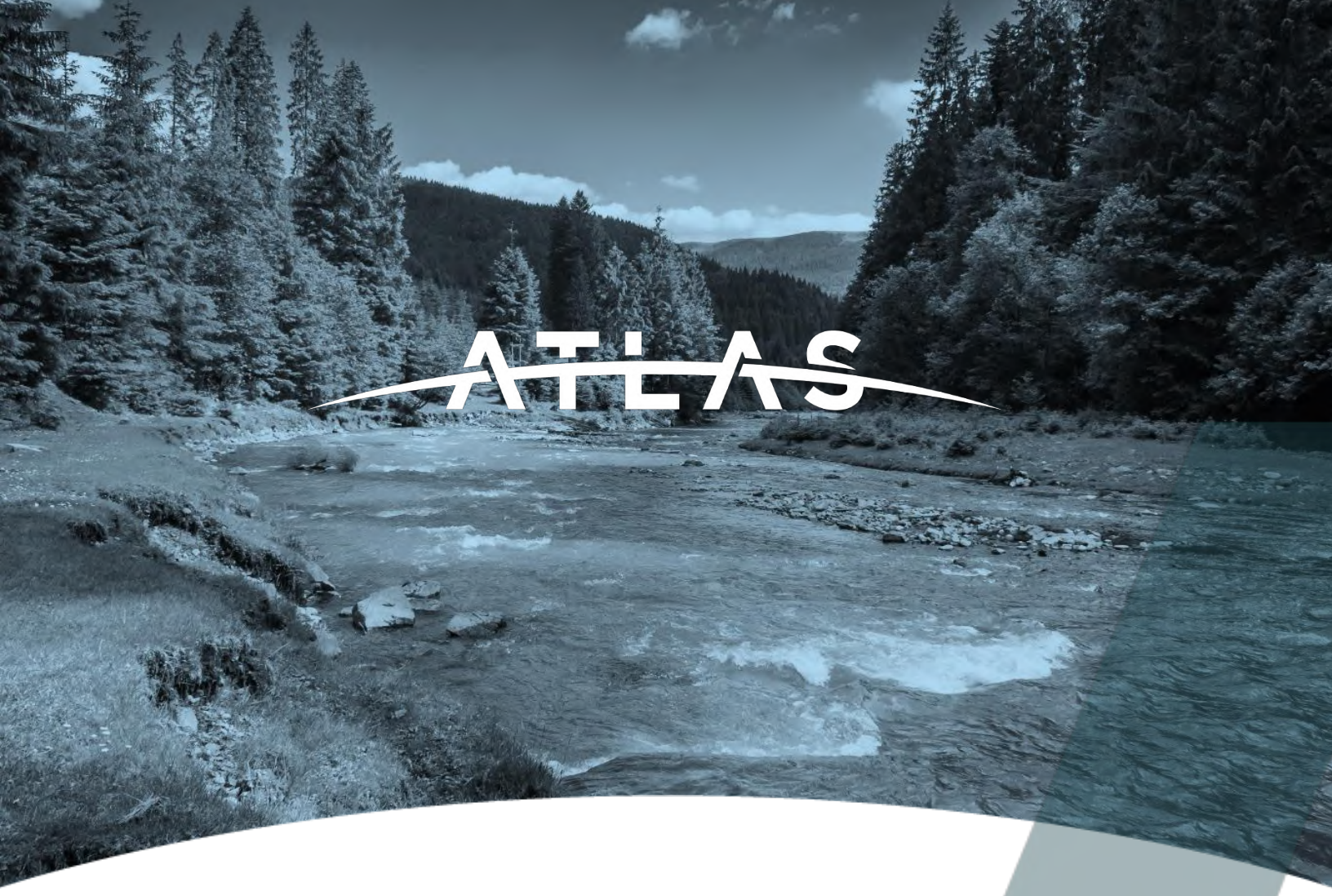
Legend:
Centerline
RightofWay
Lot Line
Wall
Exist Building
Paving
Fence
Easement
Tree
Palm Tree
Light Post
Elect. Box

Abbreviations:
FFE = Finish Floor Elevation
FG = Finish Grade
FL = Flow Line Elevation
FS = Finish Surface Elevation
GR = Exist Grade Elevation
R = Reference
TC = Top of Curb
TG = Top of Grate Elevation
TS = Top of Slope
TW = Top of Wall Elevation
WM = Water Meter
FD = Found
NTG = Nothing

JENN HARRIS
President & CEO
785 E Mission Rd, Unit 100
San Marcos, CA 92069
619-710-3124
jharris@airxus.com
www.airxutility.com

Project Name	MetLife Intersect, Irvine - Guida Surveying, Inc
AIRX Job #	22-073
Edit Date	November 14, 2023
Edited By	Lixia He

PART 6: HAZARDOUS MATERIALS SURVEY REPORT, ROOF DECK ASBESTOS SURVEY



HAZARDOUS MATERIALS SURVEY REPORT

ALTADENA MAIN LIBRARY

600 East Mariposa Street
Altadena, California 91001
Atlas Project Number 1011602022

PREPARED FOR:

Ms. Jennifer Pearson
Altadena Library District
c/o Rachlin Partners
8640 National Boulevard
Culver City, California 90232

PREPARED BY:

Atlas
1180 Durfee Avenue, Suite 125
South El Monte, California 91733

October 15, 2021

October 15, 2021

Project No. 1011602022

Ms. Jennifer Pearson
ALTADENA LIBRARY DISTRICT
C/O RACHLIN PARTNERS
8640 National Boulevard
Culver City, California 90232

Subject: **Limited Asbestos and Lead Survey Report**
Altadena Main Library
600 East Mariposa Street
Altadena, California 91001

Dear Ms. Pearson:

ATC Group Services LLC dba Atlas Technical (Atlas) is pleased to present this limited asbestos and lead survey report for the site location and buildings listed above and below in summary and introduction.

Atlas appreciates the opportunity to be of service to Altadena Library District on this project and looks forward to working with you on future assignments. In the meantime, if you have questions or comments regarding the information in this report or if we can be of further assistance, please do not hesitate to contact the undersigned.

Respectfully submitted,
Atlas

Max Quezada
Project Manager
Certified Asbestos Consultant No. 14-5205
LRC Inspector/Assessor No. LRC5220
Direct Line: 323.517.9642
Email: max.quezada@oneatlas.com

Stephen Drengson
Program Manager
Certified Asbestos Consultant No. 06-3975
LRC Inspector/Assessor No. LRC4394
Direct Line: 323.517.9650
Email: stephen.drengson@oneatlas.com

Site Survey Information Summary	
Date(s) of Survey/Inspection	September 28, 2021
Atlas Project No.	1011602022
Project Name	Altadena Main Library
Site Address	600 East Mariposa Street Altadena, California 91001
Survey Scope	Pre-Renovation Asbestos and Lead
Survey Inspector(s)	Roberto de la Torre / Max Quezada
Inspector ID No.(s)	CSST No. 00-2837 / CAC No. 14-5205
Asbestos Identified (Yes/No)	Yes (See Table 2)
Asbestos Laboratory	LA Testing 520 Mission Street South Pasadena, California 91030 Phone: (800) 303–0047
Asbestos Analytical Method	Polarized-light microscopy (PLM) and dispersion staining [Method Reference: 40 Code of Federal Regulations (CFR) Part 763, Volume 47, No. 103, May 27, 1982 pg. 23376]
Asbestos Laboratory Accreditation	National Voluntary Laboratory Accreditation Program (NVLAP) #200232-0, accredited by the National Institute of Standards and Technology (NIST), and CA ELAP 2283
Lead Inspector(s)	Roberto de la Torre / Max Quezada
Lead Inspector ID No.(s)	LRCIA No. LRC4610 / LRCIA No. LRC5220
Lead-Based Paint Identified (Yes/No)	Yes (See Table 5)
Lead Based Paint Laboratory	LA Testing 5431 Industrial Drive Huntington Beach, CA 92649 Phone: (800) 755-1794
Lead Based Paint Laboratory Accreditation	American Industrial Hygiene Association (AIHA) Environmental Lead LLC-ELLAP #101650, CA ELAP 1406
Lead-Based Paint Analytical Methods	United States Environmental Protection Agency (USEPA) Method SW-846 “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” using flame atomic absorption (Flame AA) method

CONTENTS

INTRODUCTION 4

1. ASBESTOS 4
   - 1.1 Sampling Methodology and Analysis 4
   - 1.2 Results 5
   - 1.3 Conclusions and Recommendations 15

2. LEAD-CONTANING MATERIALS 16
   - 2.1 Sampling Methodology and Analysis 16
   - 2.2 XRF Survey Results 18
   - 2.3 Laboratory Analyses Results 19
   - 2.4 Conclusions and Recommendations 20

3. CONCLUSIONS AND RECOMMENDATIONS 21

4. LIMITATIONS 22

TABLES

Table 1 – Asbestos Survey Results 6
Table 2 – ACM / ACCM Materials and Quantities 15
Table 3 – Positive XRF Survey Results 18
Table 4 – Lead-Based Paint Bulk Sample Survey Results 19
Table 5 – Lead-Based Paint / Materials and Quantities 20

APPENDICES

Appendix I Personnel Asbestos and Lead Certifications
Appendix II Asbestos Laboratory Analytical Report & Sample Logs
Appendix III Lead Laboratory Analytical Report, Sample Logs, XRF Logs, & CDPH Form 8552
Appendix IV Site Diagrams

INTRODUCTION

ATC Group Services LLC dba Atlas Technical (Atlas) was retained by Altadena Library District c/o Rachlin Partners to conduct an asbestos and lead survey of the library located at 600 East Mariposa Street, Altadena. The purpose of the project was to determine the presence of asbestos and lead in these assessable areas to facilitate the eventual removal of identified hazardous material prior to the building renovation activities. Site diagrams can be found in appendix IV.

The scope of the project was to identify any accessible suspect asbestos-containing materials (ACM), asbestos-containing construction materials (ACCM), or any lead-containing materials.

This asbestos and leads survey was conducted on September 28, 2021 by the following California Division of Occupational Safety and Health (DOSH) Certified Asbestos Consultant (CAC), Certified Site Surveillance Technician (CSST), and California Department of Public Health (CDPH) Certified Lead-Related Construction Inspector/Assessor (LRCIA), and Lead-Related Construction Sampling Technician (LRCST) staff:

Mr. Roberto de la Torre	CSST No. 00-2837 and LRCIA No. LRC4610
Mr. Max Quezada	CAC No. 14-5205 and LRCIA No. LRC5220

Fieldwork and report preparation were performed under the direction and guidance of Mr. Stephen Drengson, DOSH CAC No. 06-3975 and LRCIA No. LRC4394. The asbestos and lead certifications for Atlas personnel are included in Appendix I.

1. ASBESTOS

1.1 Sampling Methodology and Analysis

Atlas typically surveys buildings in teams of two, one person documenting the proceedings of the survey and the other performing bulk sampling and other miscellaneous activities. The team performs a preliminary visual inspection of the building impacted to identify and quantify suspect ACM. A sampling strategy is then developed to provide representative sampling of the suspect ACM in accordance with the methods and procedures identified in the Asbestos Hazard Emergency Response Act (AHERA) and in 40 Code of Federal Regulations (CFR) Part 61, Subpart M, United States Environmental Protection Agency (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP).

Atlas field staff utilized semi-destructive sampling methods to collect samples of accessible suspect asbestos-containing building materials. Materials typically known as non-asbestos materials (i.e. unpainted glass, metal or wood) were not sampled during this survey. Some areas of the buildings, e.g. behind walls, pipes chases, voids, etc., may not have been accessible at the time of the inspection.

Each sample is placed in a container; the container is sealed, labeled and placed in a storage bag. Samples are documented by entering the sample data on a bulk log, including a description of the material, sample number, location, condition, accessibility, friability, potential for damage, and quantity. Typically, the sample location is marked on an 8-1/2 x 11 inch not-to-scale floor plan. Throughout the process, special care is taken to prevent cross-contamination of the collected samples. Sampling equipment is cleaned after each sample is obtained. In addition, sample containers are placed directly beneath each sample location, when feasible, to collect any materials which may become dislodged during the sampling process. Any debris generated by the sampling is cleaned by wet-cleaning methods.

Bulk sample analysis is conducted by Polarized Light Microscopy (PLM) with dispersion staining as described in the "*Method for the Determination of Asbestos in Bulk Building Materials*" (EPA-600/R-93/116, July 1993). A suspect material is immersed in a solution of known refractive index and subjected to illumination of polarized light. The color displayed enables mineral identification. Quality control samples at a rate of ten percent (10%) or one per project, whichever is greater, are reanalyzed by a second, independent analyst.

Please note, in California, materials containing greater than one-tenth of one percent (>0.1%) asbestos are defined as asbestos-containing construction material (ACCM) and are regulated by DOSH.

The amended NESHAP, November 20, 1990, included a requirement that when the asbestos content of a bulk sample material is determined using procedures outlined and the asbestos content is estimated to be less than ten percent (<10%) by a method other than point counting, the parties legally responsible for a building (owner/operator) may (1) elect to assume the amount to be greater than one percent (>1%) and treat the material as a regulated asbestos-containing material, or (2) require verification of the amount by the Point Counting method. The purpose of this procedure is to minimize false negative analysis (reporting the samples as containing less than one percent (<1%) asbestos for asbestos-containing samples actually containing greater than one percent (>1%) and false positives [reporting the sample as containing greater than one percent (>1%) asbestos for samples containing less than one percent (<1%) asbestos]. Point Counting was included in NESHAP in response to a United States EPA study that found an unacceptable amount of false negative and false positive analyses by methods outlined in the interim method.

The samples were analyzed by LA Testing located in South Pasadena, California. LA Testing is certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (ELAP) and accredited by the United States Department of Commerce National Institutes of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos bulk fiber analysis.

1.2 Results

A total of one hundred and fifty-six (156) bulk asbestos samples were collected and one hundred sixty-eight (168) layers were analyzed by PLM with dispersion staining.

The following table (Table 1 – Asbestos Survey Results) summarizes the results of the survey. Materials identified as ACM or ACCM are denoted in **bold**. The asbestos laboratory analytical report and asbestos sampling logs of the materials sampled during the field survey are included in Appendix II. Site sampling diagrams are included in Appendix IV.

Table 1 – Asbestos Survey Results

Sample Number	Homogeneous Material	Location	Approximate Quantity	Asbestos Content
001	Carpet Mastic, Under Green 2' x 2' Carpet	Main Floor, Fiction Reading Area	900 SF	ND
002	Carpet Mastic, Under Green 2' x 2' Carpet	Main Floor, Service Desk	R001	ND
003	Carpet Mastic, Under Green 2' x 2' Carpet	Main Floor, Librarian Office	R001	ND
004	Carpet Mastic Under Blue 2' x 2' Carpet	Main Floor, Near Children's Books	3,000 SF	ND
005	Carpet Mastic Under Blue 2' x 2' Carpet	Main Floor, Family Service Desk	R004	ND
006	Carpet Mastic Under Blue 2' x 2' Carpet	Main Floor, Outside Restroom	R004	ND
007	Carpet Mastic Under Orange 2' x 2' Carpet	Main Floor, West Section	1,200 SF	ND
008	Carpet Mastic Under Orange 2' x 2' Carpet	Main Floor, West Section	R007	ND
009	Carpet Mastic Under Orange 2' x 2' Carpet	Main Floor, West Section	R007	ND
010	Vinyl Wood Plank, Green	Main Floor, North Magazine Area	480 SF	ND
011	Vinyl Wood Plank, Green	Main Floor, North Magazine Area	R010	ND
012	Vinyl Wood Plank, Green	Main Floor, Near Elevator	R010	ND
013	Vinyl Wood Plank Mastic (Associated 010)	Main Floor, North Magazine Area	480 SF	ND

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
014	Vinyl Wood Plank Mastic (Associated 011)	Main Floor, North Magazine Area	R013	ND
015	Vinyl Wood Plank Mastic (Associated 012)	Main Floor, Near Elevator	R013	ND
016	Vinyl Wood Plank, Blue	Main Floor, Near Children and Family Service Desk	290 SF	ND
017	Vinyl Wood Plank, Blue	Main Floor, Near Children and Family Service Desk	R016	ND
018	Vinyl Wood Plank, Blue	Main Floor, Near Children and Family Service Desk	R016	ND
019	Vinyl Wood Plank Mastic (Associated 016)	Main Floor, Near Children and Family Service Desk	290 SF	ND
020	Vinyl Wood Plank Mastic (Associated 017)	Main Floor, Near Children and Family Service Desk	R019	ND
021	Vinyl Wood Plank Mastic (Associated 018)	Main Floor, Near Children and Family Service Desk	R019	ND
022	Vinyl Wood Planks, Orange	Main Floor, Northwest Section	330 SF	ND
023	Vinyl Wood Planks, Orange	Main Floor, Northwest Section	R022	ND
024	Vinyl Wood Planks, Orange	Main Floor, Northwest Section	R022	ND
025	Vinyl Wood Planks Mastic (Associated 022)	Main Floor, Northwest Section	330 SF	ND
026	Vinyl Wood Planks Mastic (Associated 023)	Main Floor, Northwest Section	R025	ND

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
027	Vinyl Wood Planks Mastic (Associated 024)	Main Floor, Northwest Section	R025	ND
028	Vinyl Wood Planks, Brown	Main Floor, Near Stairwell	1,000 SF	ND
029	Vinyl Wood Planks, Brown	Main Floor, Reception Office Area	R028	ND
030	Vinyl Wood Planks, Brown	Main Floor, Circulation Room	R028	ND
031	Vinyl Wood Planks Mastic (Associated 028)	Main Floor, Near Stairwell	1,000 SF	ND
032	Vinyl Wood Planks Mastic (Associated 029)	Main Floor, Reception Office Area	R031	ND
033	Vinyl Wood Planks Mastic (Associated 030)	Main Floor, Circulation Room	R031	ND
034	**9” x 9” Vinyl Floor Tile, Off White with Brown Smudges**	**Main Floor, Circulation Room**	**400 SF**	**3% Chrysotile**
035	**9” x 9” Vinyl Floor Tile, Off White with Brown Smudges**	**Main Floor, Circulation Room**	**R034**	**4% Chrysotile**
036	**9” x 9” Vinyl Floor Tile, Off White with Brown Smudges**	**Main Floor, Janitorial Room**	**R034**	**7% Chrysotile**
037	**Vinyl Floor Tile Mastic (Associated 034)**	**Main Floor, Circulation Room**	**400 SF**	**7% Chrysotile**
038	**Vinyl Floor Tile Mastic (Associated 035)**	**Main Floor, Circulation Room**	**R037**	**10% Chrysotile**
039	**Vinyl Floor Tile Mastic (Associated 036)**	**Main Floor, Janitorial Room**	**R037**	**10% Chrysotile**
040	Ceramic Floor Tile Mortar	Main Floor, Men’s Restroom	100 SF	ND
041	Ceramic Floor Tile Mortar	Mid-Level, Men’s Restroom	R040	ND
042	Ceramic Floor Tile Mortar	Lower Level, Women’s Restroom	R040	ND
043	4” Baseboard	Main Floor, Librarian Office	450 LF	ND

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
044	4” Baseboard	Main Floor, Near Restrooms	R043	ND
045	4” Baseboard	Main Floor, Circulation Room	R043	ND
046	4” Baseboard Mastic (Associated 043)	Main Floor, Librarian Office	450 LF	ND
047	4” Baseboard Mastic (Associated 044)	Main Floor, Near Restrooms	R046	ND
048	4” Baseboard Mastic (Associated 045)	Main Floor, Circulation Room	R046	ND
049	**Interior Stucco**	**Main Floor, South Ceiling**	**4,500 SF**	**0.8% Chrysotile by 1,000 PC (ACCM)**
050	**Interior Stucco**	**Main Floor, South Column**	**R049**	**0.8% Chrysotile by 1,000 PC (ACCM)**
051	**Interior Stucco**	**Main Floor, West Column**	**R049**	**1% Chrysotile by 1,000 PC (ACCM)**
052	**Interior Stucco**	**Main Floor, North Ceiling**	**R049**	**0.8% Chrysotile by 1,000 PC (ACCM)**
053	**Interior Stucco**	**Main Floor, East Ceiling**	**R049**	**1% Chrysotile by 1,000 PC (ACCM)**
054	Plaster	Main Floor, Outside Men’s Restroom	1,500 SF	ND
055	Plaster	Main Floor, Outside Women’s Restroom	R054	ND
056	Plaster	Main Floor, Janitorial Room in Circulation	R054	ND
057	Plaster	Main Floor, Women’s Restroom Ceiling	R054	ND
058	Plaster	Main Floor, Men’s Restroom Ceiling	R054	ND
059	CMU Mortar	Main Floor, Southwest Section	5,000 SF	ND
060	CMU Mortar	Main Floor, Librarian Office	R059	ND

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
061	CMU Mortar	Main Floor, Near Elevator	R059	ND
062	Vinyl Wood Plank, Grey	Mid-Level, Foyer	150 SF	ND
063	Vinyl Wood Plank, Grey	Mid-Level, Foyer	R062	ND
064	Vinyl Wood Plank, Grey	Mid-Level, Foyer	R062	ND
065	Vinyl Wood Plank Mastic (Associated 062)	Mid-Level, Foyer	150 SF	ND
066	Vinyl Wood Plank Mastic (Associated 063)	Mid-Level, Foyer	R065	ND
067	Vinyl Wood Plank Mastic (Associated 064)	Mid-Level, Foyer	R065	ND
068	**9” x 9” Vinyl Floor Tile, Beige**	**Mid-Level, Electrical Room**	**1,000 SF**	**3% Chrysotile**
069	**9” x 9” Vinyl Floor Tile, Beige**	**Mid-Level, Electrical Room**	**R068**	**3% Chrysotile**
070	**9” x 9” Vinyl Floor Tile, Beige**	**Mid-Level, Storage Closet**	**R068**	**3% Chrysotile**
071	**Vinyl Floor Tile Mastic (Associated 068)**	**Mid-Level, Electrical Room**	**1,000 SF**	**6% Chrysotile**
072	**Vinyl Floor Tile Mastic (Associated 069)**	**Mid-Level, Electrical Room**	**R071**	**7% Chrysotile**
073	**Vinyl Floor Tile Mastic (Associated 070)**	**Mid-Level, Storage Closet**	**R071**	**10% Chrysotile**
074	Carpet Mastic	Mid-Level, Foyer Steps	150 SF	ND
075	Carpet Mastic	Mid-Level, Foyer Steps	R074	ND
076	Carpet Mastic	Mid-Level, Foyer Steps	R074	ND
077	4” Baseboard	Mid-Level, Electrical Room	80 LF	ND
078	4” Baseboard	Mid-Level, Storage Closet	R077	ND
079	4” Baseboard	Mid-Level, Stage	R077	ND
080	Baseboard Mastic (Associated 077)	Mid-Level, Electrical Room	80 LF	ND
081	Baseboard Mastic (Associated 078)	Mid-Level, Storage Closet	R080	ND

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
082	Baseboard Mastic (Associated 079)	Mid-Level, Stage	R080	ND
083	4” Baseboard, Brown	Mid-Level, Community Room	100 LF	ND
084	4” Baseboard, Brown	Mid-Level, Community Room	R083	ND
085	4” Baseboard, Brown	Mid-Level, Community Room	R083	ND
086	Baseboard Mastic (Associated 083)	Mid-Level, Community Room	100 LF	ND
087	Baseboard Mastic (Associated 084)	Mid-Level, Community Room	R086	ND
088	Baseboard Mastic (Associated 085)	Mid-Level, Community Room	R086	ND
089	Interior Stucco	Mid-Level, Foyer	R090	N*
090	**Interior Stucco**	**Mid-Level, Foyer**	**200 SF**	**0.1% Chrysotile by 1,000 PC (ACCM)**
091	Interior Stucco	Mid-Level, Foyer	R090	N*
092	Wall Tile Mortar	Main Floor, Men’s Restroom	1,500 SF	ND
093	Wall Tile Mortar	Mid-Level, Men’s Restroom	R092	ND
094	Wall Tile Mortar	Lower Level, Women’s Restroom	R092	ND
095	Wall Tile Grout	Main Floor, Men’s Restroom	1,500 SF	ND
096	Wall Tile Grout	Mid-Level, Men’s Restroom	R095	ND
097	Wall Tile Grout	Lower Level, Women’s Restroom	R095	ND
098	**9” x 9” Vinyl Floor Tile, White with Red Smudges**	**Lower Level, Hallway**	**500 SF**	**5% Chrysotile**

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
099	**9” x 9” Vinyl Floor Tile, White with Red Smudges**	**Lower Level, Hallway**	**R098**	**5% Chrysotile**
100	**9” x 9” Vinyl Floor Tile, White with Red Smudges**	**Lower Level, Hallway**	**R098**	**5% Chrysotile**
101	**Vinyl Floor Tile Mastic (Associated 098)**	**Lower Level, Hallway**	**500 SF**	**8% Chrysotile**
102	**Vinyl Floor Tile Mastic (Associated 099)**	**Lower Level, Hallway**	**R101**	**8% Chrysotile**
103	**Vinyl Floor Tile Mastic (Associated 100)**	**Lower Level, Hallway**	**R101**	**7% Chrysotile**
104	Vinyl Sheet Flooring	Lower Level, Storage Room	200 SF	ND
105	Vinyl Sheet Flooring	Lower Level, Storage Room	R104	ND
106	Vinyl Sheet Flooring	Lower Level, Storage Room	R104	ND
107	Vinyl Sheet Flooring Mastic (Associated 104)	Lower Level, Storage Room	200 SF	ND
108	Vinyl Sheet Flooring Mastic (Associated 105)	Lower Level, Storage Room	R107	ND
109	Vinyl Sheet Flooring Mastic (Associated 106)	Lower Level, Storage Room	R107	ND
110	Flooring Felt (Associated 104)	Lower Level, Storage Room	200 SF	ND
111	Flooring Felt (Associated 105)	Lower Level, Storage Room	R110	ND
112	Flooring Felt (Associated 106)	Lower Level, Storage Room	R110	ND
113	Vinyl Wood Floor, Beige	Lower Level, Technical Services	200 SF	ND
114	Vinyl Wood Floor, Beige	Lower Level, Technical Services	R113	ND
115	Vinyl Wood Floor, Beige	Lower Level, Technical Services	R113	ND

Table 1 – Asbestos Survey Results				
Sample Number	Homogeneous Material	Location	Approximate Quantity	Asbestos Content
116	Vinyl Wood Floor Mastic (Associated 113)	Lower Level, Technical Services	1,200 SF	ND
117	Vinyl Wood Floor Mastic (Associated 114)	Lower Level, Technical Services	R116	ND
118	Vinyl Wood Floor Mastic (Associated 115)	Lower Level, Technical Services	R116	ND
119	Vinyl Wood Floor, Brown	Lower Level, Staff Lounge	240 SF	ND
120	Vinyl Wood Floor, Brown	Lower Level, Staff Lounge	R119	ND
121	Vinyl Wood Floor, Brown	Lower Level, Staff Lounge	R119	ND
122	Vinyl Wood Floor Mastic	Lower Level, Staff Lounge	240 SF	ND
123	Vinyl Wood Floor Mastic	Lower Level, Staff Lounge	R122	ND
124	Vinyl Wood Floor Mastic	Lower Level, Staff Lounge	R122	ND
125	4” Baseboard, Beige	Lower Level, Hallway	150 LF	ND
126	4” Baseboard, Beige	Lower Level, Hallway	R125	ND
127	4” Baseboard, Beige	Lower Level, Hallway	R125	ND
128	Baseboard Mastic (Associated 125)	Lower Level, Hallway	150 LF	ND
129	Baseboard Mastic (Associated 126)	Lower Level, Hallway	R128	ND
130	Baseboard Mastic (Associated 127)	Lower Level, Hallway	R128	ND
131	4” Baseboard, Brown	Lower Level, Technical Services	120 LF	ND
132	4” Baseboard, Brown	Lower Level, Technical Services	R131	ND
133	4” Baseboard, Brown	Lower Level, Technical Services	R131	ND

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
134	Baseboard Mastic (Associated 131)	Lower Level, Technical Services	120 LF	ND
135	Baseboard Mastic (Associated 131)	Lower Level, Technical Services	R134	ND
136	Baseboard Mastic (Associated 131)	Lower Level, Technical Services	R134	ND
137	Plaster	Lower Level, Hallway	R138	ND
138	**Plaster**	**Lower Level, Library Storage**	**2,000 SF**	**0.9% Chrysotile by 1,000 PC (ACCM)**
139	**Plaster**	**Lower Level, Technical Services**	**R138**	**1% Chrysotile by 1,000 PC (ACCM)**
140	CMU Mortar	Lower Level, Library Storage	1,500 SF	ND
141	CMU Mortar	Lower Level, Hallway Lockers	R140	ND
142	CMU Mortar	Lower Level, Technical Services	R140	ND
143	Interior Stucco	Lower Level, Men's Restroom	4,000 SF	ND
144	Interior Stucco	Lower Level, Hallway Exit	R143	ND
145	Interior Stucco	Lower Level, Hallway Lockers	R143	ND
146	Interior Stucco	Lower Level, Technical Services	R143	ND
147	Interior Stucco	Lower Level, Library Storage	R143	ND
148	Penetrating Plastic	Roof, Column Support	200 SF	ND
149	Penetrating Plastic	Roof, Column Support	R148	ND
150	Penetrating Plastic	Roof, Column Support	R148	ND
151	Rolled on Roofing Asphalt	North Roof	3,500 SF	ND
152	Rolled on Roofing Asphalt	East Roof	R151	ND
153	Rolled on Roofing Asphalt	West Roof	R151	ND

Table 1 – Asbestos Survey Results				
Sample Number	Homogeneous Material	Location	Approximate Quantity	Asbestos Content
154	Vent Mastic	Roof, HVAC	200 LF	ND
155	Vent Mastic	Roof, HVAC	R154	ND
156	Vent Mastic	Roof, HVAC	R154	ND

ND = None Detected

SF = Square Feet

R001 = Refer to quantity of sample 001.

1000 PC = 1000 Point Count Analysis

ACCM = Asbestos-containing Construction Material

N* = Sample was initially analyzed by using PLM methods, was re-analyzed using the 1000 PC and found to be <0.1% asbestos.

1.3 Conclusions and Recommendations

Based on the survey results, asbestos was identified in the materials listed in the following table (Table 2 – ACM or ACCM Materials and Quantities). It should be assumed that any of the materials listed below when encountered within the building should be treated as ACM or ACCM.

Table 2 – ACM / ACCM Materials and Quantities				
Homogenous Material	Location	Approximate Quantity	Condition	Asbestos Content
9” x 9” Off White with Brown Smudges Vinyl Floor Tile and Associated Mastic	Main Floor, Circulation Room and Janitorial Room	400 SF	Intact	3-10% Chrysotile
Interior Stucco	Main Floor, Ceiling, South Column, and West Column. Mid-Level, Foyer	4,700 SF	Intact	0.1-1% Chrysotile by 1,000 PC (ACCM)
9” x 9” Beige Vinyl Floor Tile and Associated Mastic	Mid-Level, Electrical Room and Storage Closet	1,000 SF	Intact	3-10% Chrysotile
9” x 9” White with Red Smudges Vinyl Floor Tile and Associated Mastic	Lower Level, Hallway	500 SF	Intact	5% Chrysotile
Plaster	Lower Level, Library Storage	2,000 SF	Intact	0.9-1% Chrysotile by 1,000 PC (ACCM)

SF = Square Feet

ACCM = Asbestos-containing Construction Material

If additional suspect materials are observed by the contractor during abatement/renovation, the consultant should be notified and the presence of these materials should be verified. All materials listed above should be removed and disposed of as ACM prior to any renovation activities. Certain materials may not have been visible during the initial survey such as barrier paper under wood, materials behind walls, materials in pipe chases, and materials under the building structure.

Asbestos is a hazardous substance. Its condition, handling and disposal are regulated by Federal, State, and local agencies. ACMs and ACCMs generally do not pose a health threat unless the asbestos fibers are disturbed by renovation, construction or demolition and may become airborne and inhaled.

A building material is considered to be ACM if at least one sample collected from the homogeneous material shows asbestos present in an amount greater than one percent (>1%). Materials with less than one percent (<1%) asbestos are not regulated by the EPA or Federal Occupational Safety and Health Administration (OSHA). However, the DOSH does regulate materials with greater than one-tenth of one percent (>0.1%) under California Code of Regulations (CCR) Title 8, Section 1529. These materials are considered ACCMs.

Atlas recommends removal of the noted ACMs and ACCMs above that will be disturbed during the planned renovation prior to any renovation activities. Contractors must use asbestos safe work practices when disturbing the material listed above.

Building occupants and contractors working in an area where asbestos is present must be informed of the type and location of ACM or ACCM. Since these materials are going to be impacted during the planned building renovation, Atlas recommends abatement of all identified ACM and ACCM by a California licensed, certified and registered asbestos abatement contractor. Asbestos abatement must be performed in accordance with Federal OSHA, DOSH, and the South Coast Air Quality Management District (SCAQMD).

The DOSH also requires employers to implement specific work practices, which protect workers from airborne asbestos exposure. Building materials, which contain even low levels of asbestos (trace amounts), can potentially generate significant concentrations of airborne asbestos fibers when disturbed. Therefore, control measures should be instituted which adequately addresses worker health and safety during the planned renovation activities involving these materials.

2. LEAD-CONTANING MATERIALS

2.1 Sampling Methodology and Analysis

Atlas' field technician(s) conducted a visual inspection of the building and observed most interior paint to be intact. Atlas' field staff utilized an X-Ray Fluorescence (XRF) Analyzer device as well as collected representative samples of suspect lead-based paint that was observed to be loose and flakey.

The lead testing was performed on-site using an XRF Analyzer on various surfaces, according to the procedures identified in Chapter 7 of the *Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint (LBP) in Housing,* and the XRF-specific *Performance Characteristic Sheet* (PCS) methodology for the Heuresis Pb200i Lead Paint Analyzer.

The Heuresis Pb200i Lead Paint Analyzer is a complete lead paint analysis system, which quickly, accurately, and non-destructively measures the concentration of LBP on surfaces. The Heuresis Pb200i relies on the measurement of the K-shell X-rays simultaneously to determine the amount of lead present in the painted surface. These X-rays can penetrate many layers of paint and allow a good measurement of the lead content of paint to be made without being significantly affected by the thickness or number of layers of paint on the surface of the sample.

The Heuresis Pb200i has the ability to analyze and compute corrections for the differences in the energy spectrums relating to different substrates. This analysis of the energy spectrum means that the lead paint reading displayed on the instrument already accounts for any substrate effects and no correction is required by the operator. The Heuresis Pb200i's field of view is deep enough to handle virtually all painted surfaces, but not prone to detect lead objects located behind the surface.

Upon arrival at the job site, a "calibration test" was performed to assure that the instrument was operating properly. A series of three calibrated readings and one “zero standard” reading were taken at the start of each shift, and three more calibration check readings and one “zero standard” reading were taken near the end of each sampling sequence. Test measurements consisting of approximately 30 seconds per measurement were taken of three of the test block and/or NIST Paint Film Standards (SRM No. 2570-2575) as required by the instrument’s PCS. The individual readings and an average of the calibration readings were recorded and compared to standards.

In all cases the instrument was functioning within the standard deviation as defined by the manufacturer and the PCS. All validation readings were recorded in a logbook, which accompanies the instrument. If for any reason the XRF does not pass the calibration procedures, it is Atlas’ policy to replace that instrument with an XRF that passes the above criteria for calibration. HUD developed the PCS for use with the specific instrument used for testing.

Paint chip samples were collected of loose, flakey paint, in accordance with DOSH standards, and of surfaces that were measured by XRF as undetermined. One paint chip sample was collected from each identified surface meeting this criteria. Pursuant to American Society for Testing and Materials (ASTM) E 1729-05 sub-section 7.4.2: Using the appropriate cutting tool, paint was scraped down to the substrate within the marked area and collected for analysis. For brick or concrete substrates, the minimum amount needed to completely remove the paint from the substrate was collected. On wood substrates, scraping in the direction of the wood grain was conducted in order to minimize inclusion of the substrate in the collected sample.

Pursuant to ASTM E 1729-05 sub-section 9.2.4: Field data was collected to include a unique sample identifier, the sample location (including sample location description), sample component (e.g. wallboard, window sill, wallboard above ceiling grid, door, decorative brick, paint applied to concrete curb, exterior wood siding, canopy support, and ballard post), condition of the paint, color, and estimated square footage of paint coverage.

The paint chip samples were analyzed by LA Testing located in Huntington Beach, California. LA Testing is certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (ELAP) and is accredited by the American Industrial Hygiene Association's (AIHA) Laboratory Quality Assurance Program for industrial hygiene and lead analysis.

2.2 XRF Survey Results

A total of one hundred and four (104) readings were taken. Ninety (90) readings were taken throughout the interior/exterior of the building areas and fourteen (14) readings were calibration checks.

The following table (Table 3 – Positive XRF Survey Results) represents the positive results of the XRF survey. The LACDHS definition of lead-based paint/materials is lead equal to or greater than 0.7 mg/ cm^2. The lead-based paint/materials XRF sampling logs of the materials sampled during the field survey are included in Appendix III. Site sampling diagrams are included in Appendix IV.

Positive: An XRF reading is classified as positive if it is greater than or equal to 0.7 mg/cm^2.

Negative: An XRF reading is classified as negative if it is less than 0.7 mg/cm^2.

Table 3 – Positive XRF Survey Results

Sample No.	XRF Results (mg/cm^2)	Condition of Paint	Approx Qty	Building/ Floor/ Room/ Area	Location	Surface	Substrate	Color
13	16.9	Intact	250 SF	Main Floor	Women's Restroom	Wall Tile	Ceramic	White
21	16.9	Intact	250 SF	Main Floor	Men's Restroom	Wall Tile	Ceramic	White
46	16.9	Intact	240 SF	Second Floor	Women's Restroom	Wall Tile	Ceramic	White
51	16.8	Intact	240 SF	Second Floor	Men's Restroom	Wall Tile	Ceramic	White

Table 3 – Positive XRF Survey Results								
Sample No.	XRF Results (mg/cm^2)	Condition of Paint	Approx Qty	Building/ Floor/ Room/ Area	Location	Surface	Substrate	Color
61	15.1	Intact	200 SF	Lower Level	Men's Restroom	Wall Tile	Ceramic	White
65	16.3	Intact	200 SF	Lower Level	Women's Restroom	Wall Tile	Ceramic	White

2.3 Laboratory Analyses Results

Atlas also collected a total of two (2) paint-chip samples for analysis of lead content. The sample(s) were submitted to LA Testing for analysis by Flame Atomic Absorption Spectrophotometry (Flame AAS) in accordance with EPA Method 7420 analytical protocol.

The following table (Table 4 – Lead-Based Paint Bulk Sample Survey Results) represents the results of the paint chip analysis via Flame AAS. The CDPH Title 17 CCR, HUD define LBP as paints containing greater than or equal to five tenths percent (≥0.5%) lead by weight or 5,000 milligrams per kilogram (mg/kg) or parts per million (ppm) total lead. Samples found to contain lead-based paint are denoted in **bold**. Samples that contain detectable levels of lead are denoted with an asterisk. The lead laboratory analytical report of the materials sampled during the field survey is included in Appendix III. Site sampling diagrams are included in Appendix IV.

When determining the condition of paint, the inspector will use their professional judgement to determine if the condition is intact, fair, or poor. Intact condition suggests the entire surface is intact and adhering to the substrate. Fair condition suggests some damage such as cracking, blistering, and some areas of loose and flakey (<10%). Poor suggests significant loose and flakey paint (>10%).

Table 4 - Lead-Based Paint Bulk Sample Survey Results						
Sample No.	Building/ Floor	Location	Surface	Substrate	Color	Results (ppm)
P01	Library	Roof	Slats	Metal	White	1,200*
P02	Library	Roof	Fascia	Metal	Red	1,300*

ppm = Parts per Million

Bold = Lead-Based Paint: concentration greater than or equal to 0.5% lead by weight or 5,000 milligrams per kilogram (mg/kg) or parts per million (ppm) total lead.
* = Lead-containing coating: concentration above detection limit

2.4 Recommendations and Conclusions

Based on the survey results, the lead-containing materials listed below in the table (Table V – Lead-Based Paint/Materials and Quantities) meet the definition of lead-based paint. The CDPH (as defined in Title 17 California Code of Regulations) and HUD define LBP as paints containing greater than 1.0 mg/cm^2, as well as, paints containing greater than or equal to 0.5% lead by weight or 5,000 mg/kg or ppm total lead. Paint containing less than these amounts but greater than the limit of detection is generally termed "lead-containing paint" (LCP).

Table 5 – Lead-Based Paint / Materials and Quantities

Material Description	Location	Condition	Approx Quantity	Results (ppm)	Results (mg/ cm^2)
White Ceramic Wall Tile	Men's and Women's Restrooms – all 3 levels	Intact	1,380 SF	-----	15.1-16.9

SF = Square Feet

Lead is a hazardous substance. Its condition, handling and disposal are regulated by Federal, State, and local agencies. Lead-containing materials, LBP and LCP, generally do not pose a health risk unless the material is disturbed or sufficiently deteriorated to produce dust, which may become airborne and inhaled or ingested.

DOSH regulations (8 CCR 1532.1 - Lead Construction Standard) do not provide a definition for "lead-based paint," but rather provide a Permissible Exposure Limit (PEL) for worker exposure to airborne lead particles of 50 micrograms per cubic meter of air (50 µg/m^3 for an 8-hour time-weighted average). The OSHA Lead Construction Standard also lists an Action Level of 30 µg/m^3 for an 8-hour time-weighted average. All employees (workers) and supervisors who are engaged in lead related construction and shown to be exposed to lead at or above the PEL, shall be trained by state-accredited training providers and certified by the CDPH.

If lead-containing material, LBP or LCP, will be impacted (activities such as demolition, sanding, sand /shot blasting, chipping or any other method of surface preparation which may cause potential airborne lead concentrations to exceed the DOSH action level) during the building renovation, Atlas recommends removal and/or stabilization of those building materials denoted above that will be disturbed during the upcoming renovation**,** as well as, other surfaces of similar substrate, color and condition. Contractor must use lead safe work practices when disturbing any of the materials listed above.

Work activities impacting the lead-containing materials pose a potential exposure risk for workers. Workers trained in proper safety and respiratory techniques should perform work activities that may impact the LBP. All construction work where an employee may be occupationally exposed to lead must comply with DOSH requirements. This regulation requires initial employee exposure monitoring to evaluate worker exposure during work that disturbs lead-containing materials (lead present in detectable levels). Any disturbance to LBP surfaces or materials, such as demolition, sanding, sand /shot blasting, chipping or any other method of surface preparation which may cause potential airborne lead concentrations above current regulatory levels are prohibited by state law.

3. CONCLUSIONS AND RECOMMENDATIONS

Based on information collected from the hazardous material portion of this survey, Atlas recommends the following:

- If impacted, remove all asbestos listed in Table 2 and remove and/or paint-film stabilize the lead listed in Table 5 as part of the pre-renovation activities in accordance with applicable Federal, State and local regulations.
- Perform a follow-up inspection of the building prior to renovation to confirm the hazardous items have been removed before commencing with renovation activities.

4. LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with principles and practices in the fields of environmental science and engineering. The results, findings, conclusions, and recommendations expressed in the report are based only on conditions that were noted during the noted dates of fieldwork. This warranty is in lieu of all other warranties either expressed or implied. This company is not responsible for the independent conclusions, opinions, or recommendations made by others based on the results and designs presented in this report.

The passage of time may result in a change in the environmental characteristics at this site and surrounding properties. This report does not warrant against future operations or conditions, nor does it warrant operations or conditions present of a type or at a location not investigated.

Reasonable effort is made by Atlas personnel to locate and sample materials representative of the site structures. However, for any facility, the existence of unique or concealed materials or debris not observed by Atlas is a possibility. Atlas does not warrant, guarantee or profess to have the ability to locate or identify all concealed hazardous materials at the facility. This report is intended for the sole use of Altadena Library District c/o Rachlin Partners. This report is not intended to be utilized as a construction and/or bidding document, nor is this document designed to be used as a remediation or abatement specification. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

This inventory does not represent an exhaustive listing of types of materials that may be required to be removed from a building prior to renovation. Any conditions or materials that could not be visually identified on the surface were not inspected and may differ from those conditions or materials noted.

APPENDIX I
Personnel Asbestos and Lead Certifications

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Roberto De La Torre
Name



Certification No. **00-2837**

Expires on **03/09/22**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

California Department of PublicHealth

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
	Lead Inspector/Assessor	LRC-00004610	4/3/2022
	Lead Project Monitor	LRC-00004609	4/3/2022

Roberto De La Torre

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD.

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant



Max A Quezada
Name

Certification No. **14-5205**

Expires on **06/11/22**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code

1180 Durfee Avenue, Suite 125, South El Monte, CA 91733
323.517.9780 | oneatlas.com

California Department of PublicHealth

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
	Lead Inspector/Assessor	LRC-00005220	1/31/2022



Max Quezada

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD.

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Stephen R Drengson
Name



Certification No. **06-3975**

Expires on **05/17/22**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code

1180 Durfee Avenue, Suite 125, South El Monte, CA 91733
323.517.9780 | oneatlas.com

California Department of PublicHealth

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
	Lead Inspector/Assessor	LRC-00004394	10/29/2021
	Lead Project Monitor	LRC-00004393	10/29/2021

Stephen Drengson

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD.

APPENDIX II
Asbestos Laboratory Analytical Report & Sample Logs

LA Testing

520 Mission Street South Pasadena, CA 91030
Phone/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order: 322118712
Customer ID: 32ATCA45
Customer PO:
Project ID:

Attention: Stephen Drengson
Atlas Technical
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733

Phone: (323) 517-9650
Fax: (323) 517-9781
Received: 10/08/2021 9:09 AM
Analysis Date: 10/12/2021
Collected:

Project: REF PLM REPORT: 322118209 | 1011602022 P1 Altadena

Test Report: Asbestos Analysis of Bulk Material via EPA 600/R-93/116. Quantitation using the 1,000 Point Count Procedure

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
049 *322118712-0001*	Mid lower main - Interior stucco-Interior main area-south ceiling	White Non-Fibrous Homogeneous		99.20% Non-fibrous (Other)	**0.8%** **Chrysotile**
050-Finish Coat *322118712-0002*	Mid lower main - Interior stucco-Interior main area-column south	White Non-Fibrous Homogeneous		99.20% Non-fibrous (Other)	**0.8%** **Chrysotile**
051-Finish Coat *322118712-0003*	Mid lower main - Interior stucco-Interior main area-column west	White Non-Fibrous Homogeneous		99.0% Non-fibrous (Other)	**1.0%** **Chrysotile**
052-Finish Coat *322118712-0004*	Mid lower main - Interior stucco-Interior main area-ceiling north	White Non-Fibrous Homogeneous		99.20% Non-fibrous (Other)	**0.8%** **Chrysotile**
053 *322118712-0005*	Mid lower main - Interior stucco-Interior main area-ceiling east	White Non-Fibrous Homogeneous		99.0% Non-fibrous (Other)	**1.0%** **Chrysotile**
089 *322118712-0006*	Mid floor-int - Interior stucco/Foyer-wall	Gray/White Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	**<0.1%** **Chrysotile**
090 *322118712-0007*	Mid floor-int - Interior stucco/Foyer-wall	Gray/White Non-Fibrous Homogeneous		99.90% Non-fibrous (Other)	**0.1%** **Chrysotile**
091 *322118712-0008*	Mid floor-int - Interior stucco/Foyer-wall	White Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	**<0.1%** **Chrysotile**
138 *322118712-0009*	Lower floor-int -	White Non-Fibrous Homogeneous		99.10% Non-fibrous (Other)	**0.9%** **Chrysotile**

LA Testing maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by LA Testing. LA Testing bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 “Interim Method”) but augmented with procedures outlined in the 1993 (”final”) version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore LA Testing recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by LA Testing South Pasadena, CA NVLAP Lab Code 200232-0, CA ELAP 2283

Initial report from: 10/12/2021 09:37:25

LA Testing

520 Mission Street South Pasadena, CA 91030
Phone/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order: 322118712
Customer ID: 32ATCA45
Customer PO:
Project ID:

Attention: Stephen Drengson
Atlas Technical
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733

Phone: (323) 517-9650
Fax: (323) 517-9781
Received: 10/08/2021 9:09 AM
Analysis Date: 10/12/2021
Collected:

Project: REF PLM REPORT: 322118209 | 1011602022 P1 Altadena

Test Report: Asbestos Analysis of Bulk Material via EPA 600/R-93/116. Quantitation using the 1,000 Point Count Procedure

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
139-Finish Coat *322118712-0010*	Lower floor-int - Plaster/technical services-wall	White Non-Fibrous Homogeneous		99.0% Non-fibrous (Other)	**1.0% Chrysotile**

Analyst(s)

Tania Lopez (10)

Jerry Drapala Ph.D, Laboratory Manager
or other approved signatory

LA Testing maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by LA Testing. LA Testing bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore LA Testing recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by LA Testing South Pasadena, CA NVLAP Lab Code 200232-0, CA ELAP 2283

Initial report from: 10/12/2021 09:37:25

LA Testing

520 Mission Street South Pasadena, CA 91030

Tel/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Attention:	Stephen Drengson	**Phone:**	(323) 517-9650
	Atlas Technical	**Fax:**	(323) 517-9781
	1180 Durfee Avenue, Suite 125	**Received Date:**	09/30/2021 11:00 AM
	South El Monte, CA 91733	**Analysis Date:**	10/05/2021
		Collected Date:	09/28/2021
Project:	1011602022 P1 Altadena		

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
001 *322118209-0001*	Main floor-interior - Carpet mastic(under green)2'x2'/Fiction area(opp corner of children's books-floor(main)	Brown/Yellow Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
002 *322118209-0002*	Main floor-interior - Carpet mastic(under green)2'x2'/Near info desk/public copier-floor	Brown/Yellow Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
003 *322118209-0003*	Main floor-interior - Carpet mastic(under green)2'x2'/Librarian office-floor	Brown/Yellow Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
004 *322118209-0004*	Main floor-interior - Carpet mastic(under blue)2'x2'(main)Near children's books-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
005 *322118209-0005*	Main floor-interior - Carpet mastic(under blue)2'x2'(main)Family service desk-floor	Yellow Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
006 *322118209-0006*	Main floor-interior - Carpet mastic(under blue)2'x2'(main)Near restrooms-floor	Yellow/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
007 *322118209-0007*	Main floor-interior - Carpet mastic(under orange)2'x2'/West section-floor(main area)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
008 *322118209-0008*	Main floor-interior - Carpet mastic(under orange)2'x2'/West section-floor(main area)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
009 *322118209-0009*	Main floor-interior - Carpet mastic(under orange)2'x2'/West section-floor(main area)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
010 *322118209-0010*	Main floor-interior - Wood plank(green)vinyl/Magazine area-north end-floor(main)	Gray/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing

520 Mission Street South Pasadena, CA 91030

Tel/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
011 *322118209-0011*	Main floor-interior - Wood plank(green)vinyl/Magazine area-north end-floor(main)	Gray/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
012 *322118209-0012*	Main floor-interior - Wood plank(green)vinyl/Near elevator-floor	Gray/Green/Orange Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
013 *322118209-0013*	Main floor-interior - Vinyl wood plank mastic(assoc 010-012)Magazine area-north end-floor(main)	Yellow/Clear Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
014 *322118209-0014*	Main floor-interior - Vinyl wood plank mastic(assoc 010-012)Magazine area-north end-floor(main)	Yellow/Clear Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
015 *322118209-0015*	Main floor-interior - Vinyl wood plank mastic(assoc 010-012)Near elevator-north end-floor	Gray/Yellow Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
016 *322118209-0016*	Main floor-interior - Vinyl wood plank(blue)Near children & family serv desk-floor(main)	Gray/Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
017 *322118209-0017*	Main floor-interior - Vinyl wood plank(blue)Near children & family serv desk-floor(main)	Gray/Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
018 *322118209-0018*	Main floor-interior - Vinyl wood plank(blue)Near children & family serv desk-floor(main)	Gray/Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
019 *322118209-0019*	Main floor-interior - VWP mastic(assoc 016-018)Near children & family serv desk-floor(main)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
020 *322118209-0020*	Main floor-interior - VWP mastic(assoc 016-018)Near children & family serv desk-floor(main)	Yellow/Clear Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
021 *322118209-0021*	Main floor-interior - VWP mastic(assoc 016-018)Near children & family serv desk-floor(main)	Gray/Yellow Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order: 322118209
Customer ID: 32ATCA45
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
022 *322118209-0022*	Main floor-interior - Vinyl wood planks(orange)NW section-flood(main area)	Gray/Orange Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
023 *322118209-0023*	Main floor-interior - Vinyl wood planks(orange)NW section-flood(main area)	Gray/Orange Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
024 *322118209-0024*	Main floor-interior - Vinyl wood planks(orange)NW section-flood(main area)	Gray/Orange Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
025 *322118209-0025*	Main floor-interior - VWP-mastic(assoc 022-024)NW section-floor(main area)	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
026 *322118209-0026*	Main floor-interior - VWP-mastic(assoc 022-024)NW section-floor(main area)	Yellow Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
027 *322118209-0027*	Main floor-interior - VWP-mastic(assoc 022-024)NW section-floor(main area)	Yellow/Beige Non-Fibrous Homogeneous	2% Synthetic	98% Non-fibrous (Other)	None Detected
028 *322118209-0028*	Main floor-interior - Vinyl wood planks(brown)Main area-near stairs	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
029 *322118209-0029*	Main floor-interior - Vinyl wood planks(brown)Main area-reception office area	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
030 *322118209-0030*	Main floor-interior - Vinyl wood planks(brown)Main area-circulation	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
031 *322118209-0031*	Main floor-interior - VWD mastic(assoc 028-030)Main area-near stairs	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
032 *322118209-0032*	Main floor-interior - VWD mastic(assoc 028-030)Main area-reception office area	Yellow/Clear Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
033 *322118209-0033*	Main floor-interior - VWD mastic(assoc 028-030)Main area-circulation	Yellow/Beige Non-Fibrous Homogeneous	2% Synthetic	98% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing

520 Mission Street South Pasadena, CA 91030

Tel/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
034 *322118209-0034*	Main floor-interior - Vinyl floor tile(9'x9')off white w/brown smudges/Circulation rm-floor	White Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
035 *322118209-0035*	Main floor-interior - Vinyl floor tile(9'x9')off white w/brown smudges/Circulation rm-floor	White Non-Fibrous Homogeneous		96% Non-fibrous (Other)	4% Chrysotile
036 *322118209-0036*	Main floor-interior - Vinyl floor tile(9'x9')off white w/brown smudges/Janitor rm-floor	Brown/Beige Non-Fibrous Homogeneous		93% Non-fibrous (Other)	7% Chrysotile
037 *322118209-0037*	Main floor-interior - VFT mastic(assoc 034-036)Circulation rm-floor	Black Non-Fibrous Homogeneous		93% Non-fibrous (Other)	7% Chrysotile
038 *322118209-0038*	Main floor-interior - VFT mastic(assoc 034-036)Circulation rm-floor	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
039 *322118209-0039*	Main floor-interior - VFT mastic(assoc 034-036)Janitor rm-floor	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
040 *322118209-0040*	Main floor-interior - Ceramic floor tile-mortar/Men's restroom-floor	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
041 *322118209-0041*	Mid lower main - Ceramic floor tile-mortar/Men's restroom-floor	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
042 *322118209-0042*	Mid lower main - Ceramic floor tile-mortar/Women's restroom-floor	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
043 *322118209-0043*	Mid lower main - Baseboard(4 in)Librarian office-wall	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
044 *322118209-0044*	Mid lower main - Baseboard(4 in)Main area(near rr)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
045 *322118209-0045*	Mid lower main - Baseboard(4 in)Circulation	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
046 *322118209-0046*	Mid lower main - Baseboard mastic(assoc 043-045)Librarian office-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
047 *322118209-0047*	Mid lower main - Baseboard mastic(assoc 043-045)Main area(near rr)	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing

520 Mission Street South Pasadena, CA 91030

Tel/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
048 *322118209-0048*	Mid lower main - Baseboard mastic(assoc 043-045)Circulation	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
049 *322118209-0049*	Mid lower main - Interior stucco-Interior main area-south ceiling	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
050-Finish Coat *322118209-0050*	Mid lower main - Interior stucco-Interior main area-column south	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
050-Base Coat *322118209-0050A*	Mid lower main - Interior stucco-Interior main area-column south	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
051-Finish Coat *322118209-0051*	Mid lower main - Interior stucco-Interior main area-column west	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
051-Base Coat *322118209-0051A*	Mid lower main - Interior stucco-Interior main area-column west	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
052-Finish Coat *322118209-0052*	Mid lower main - Interior stucco-Interior main area-ceiling north	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
052-Base Coat *322118209-0052A*	Mid lower main - Interior stucco-Interior main area-ceiling north	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
053-Finish Coat *322118209-0053*	Mid lower main - Interior stucco-Interior main area-ceiling east	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
053-Base Coat *322118209-0053A*	Mid lower main - Interior stucco-Interior main area-ceiling east	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
054-Finish Coat *322118209-0054*	Mid lower main - Plaster-Main area-outside men's rr-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
054-Base Coat *322118209-0054A*	Mid lower main - Plaster-Main area-outside men's rr-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
055 *322118209-0055*	Mid lower main - Plaster-Main area-outside women's rr-wall	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
056-Finish Coat *322118209-0056*	Mid lower main - Plaster-Circulation rm-janitor room-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
056-Base Coat *322118209-0056A*	Mid lower main - Plaster-Circulation rm-janitor room-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
057-Finish Coat *322118209-0057*	Mid lower main - Plaster-Women's rr-ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
057-Base Coat *322118209-0057A*	Mid lower main - Plaster-Women's rr-ceiling	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
058-Finish Coat *322118209-0058*	Mid lower main - Plaster-Men's rr-ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
058-Base Coat *322118209-0058A*	Mid lower main - Plaster-Men's rr-ceiling	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
059 *322118209-0059*	Mid lower main - CMU mortar/SW section-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
060 *322118209-0060*	Mid lower main - CMU mortar/Librarian-wall-east	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
061 *322118209-0061*	Main floor-int - CMU mortar/Main area(near elevator)-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
062 *322118209-0062*	Mid floor-int - Vinyl wood plank(grey)Foyer-floor	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
063 *322118209-0063*	Mid floor-int - Vinyl wood plank(grey)Foyer-floor	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
064 *322118209-0064*	Mid floor-int - Vinyl wood plank(grey)Foyer-floor	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
065 *322118209-0065*	Mid floor-int - VWD mastic(assoc 062-064)Foyer-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
066 *322118209-0066*	Mid floor-int - VWD mastic(assoc 062-064)Foyer-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
067 *322118209-0067*	Mid floor-int - VWD mastic(assoc 062-064)Foyer-floor	Yellow/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
068 *322118209-0068*	Mid floor-int - Vinyl floor tile 9x9(beige)Electric room-floor	Beige Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
069 *322118209-0069*	Mid floor-int - Vinyl floor tile 9x9(beige)Electric room-floor	Beige Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
070 *322118209-0070*	Mid floor-int - Vinyl floor tile 9x9(beige)Storage closet-floor	Beige Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
071 *322118209-0071*	Mid floor-int - VFT mastic(assoc 068-070)Electric rm-floor	Black Non-Fibrous Homogeneous		94% Non-fibrous (Other)	6% Chrysotile
072 *322118209-0072*	Mid floor-int - VFT mastic(assoc 068-070)Electric rm-floor	Black Non-Fibrous Homogeneous		93% Non-fibrous (Other)	7% Chrysotile

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order: 322118209
Customer ID: 32ATCA45
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
073 *322118209-0073*	Mid floor-int - VFT mastic(assoc 068-070)Storage closet-floor	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
074 *322118209-0074*	Mid floor-int - Carpet mastic/Foyer steps-steps	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
075 *322118209-0075*	Mid floor-int - Carpet mastic/Foyer steps-steps	Yellow Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
076 *322118209-0076*	Mid floor-int - Carpet mastic/Foyer steps-steps	Brown/Yellow Non-Fibrous Homogeneous	2% Synthetic	98% Non-fibrous (Other)	None Detected
077 *322118209-0077*	Mid floor-int - Baseboard(4 in)beige/Electric room-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
078 *322118209-0078*	Mid floor-int - Baseboard(4 in)beige/Storage closet-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
079 *322118209-0079*	Mid floor-int - Baseboard(4 in)beige/Stage-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
080 *322118209-0080*	Mid floor-int - Baseboard mastic(assoc 077-079)Electric rm-wall	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
081 *322118209-0081*	Mid floor-int - Baseboard mastic(assoc 077-079)Storage closet-wall	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
082 *322118209-0082*	Mid floor-int - Baseboard mastic(assoc 077-079)Stage-wall	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
083 *322118209-0083*	Mid floor-int - Baseboard(4 in)brown/Community rm-wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
084 *322118209-0084*	Mid floor-int - Baseboard(4 in)brown/Community rm-wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
085 *322118209-0085*	Mid floor-int - Baseboard(4 in)brown/Community rm-wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
086 *322118209-0086*	Mid floor-int - Baseboard mastic(assoc 083-085)Community rm-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
087 *322118209-0087*	Mid floor-int - Baseboard mastic(assoc 083-085)Community rm-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
088 *322118209-0088*	Mid floor-int - Baseboard mastic(assoc 083-085)Community rm-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
089 *322118209-0089*	Mid floor-int - Interior stucco/Foyer-wall	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	<1% Chrysotile
090 *322118209-0090*	Mid floor-int - Interior stucco/Foyer-wall	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	<1% Chrysotile
091 *322118209-0091*	Mid floor-int - Interior stucco/Foyer-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	<1% Chrysotile
092 *322118209-0092*	Main floor-int - Wall tile mortar/Men's rr-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
093 *322118209-0093*	Mid floor-int - Wall tile mortar/Men's rr-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
094 *322118209-0094*	Lower floor-int - Wall tile mortar/Women's rr-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
095 *322118209-0095*	Main floor-int - Wall tile grout/Men's restroom-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
096 *322118209-0096*	Mid floor-int - Wall tile grout/Men's restroom-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
097 *322118209-0097*	Lower floor-int - Wall tile grout/Women's restroom-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
098 *322118209-0098*	Lower floor-int - Vinyl floor tile(9x9)White w/red smudges/hallway-floor	Gray/White Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
099 *322118209-0099*	Lower floor-int - Vinyl floor tile(9x9)White w/red smudges/hallway-floor	Gray/White Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
100 *322118209-0100*	Lower floor-int - Vinyl floor tile(9x9)White w/red smudges/hallway-floor	Beige Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
101 *322118209-0101*	Lower floor-int - VFT mastic(assoc 098-100)Hallway-floor	Black Non-Fibrous Homogeneous		92% Non-fibrous (Other)	8% Chrysotile
102 *322118209-0102*	Lower floor-int - VFT mastic(assoc 098-100)Hallway-floor	Black Non-Fibrous Homogeneous		92% Non-fibrous (Other)	8% Chrysotile

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order: 322118209
Customer ID: 32ATCA45
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
103 *322118209-0103*	Lower floor-int - VFT mastic(assoc 098-100)Hallway-floor	Black Non-Fibrous Homogeneous		93% Non-fibrous (Other)	7% Chrysotile
104 *322118209-0104*	Lower floor-int - Vinyl sheet flooring/Storage room-floor	White/Beige Non-Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
105 *322118209-0105*	Lower floor-int - Vinyl sheet flooring/Storage room-floor	White/Beige Non-Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
106 *322118209-0106*	Lower floor-int - Vinyl sheet flooring/Storage room-floor	Beige Fibrous Heterogeneous	5% Cellulose 15% Glass	80% Non-fibrous (Other)	None Detected
107 *322118209-0107*	Lower floor-int - VSF mastic(assoc 104-106)Storage room-floor	Brown Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
108 *322118209-0108*	Lower floor-int - VSF mastic(assoc 104-106)Storage room-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
109 *322118209-0109*	Lower floor-int - VSF mastic(assoc 104-106)Storage room-floor	Black/Beige Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (Other)	None Detected
110 *322118209-0110*	Lower floor-int - Flooring felt(assoc 104-106)Storage rm-floor	Brown Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
111 *322118209-0111*	Lower floor-int - Flooring felt(assoc 104-106)Storage rm-floor	Brown Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
112 *322118209-0112*	Lower floor-int - Flooring felt(assoc 104-106)Storage rm-floor	Black Fibrous Homogeneous	85% Cellulose	15% Non-fibrous (Other)	None Detected
113 *322118209-0113*	Lower floor-int - Vinyl wood floor-beige/Technical services-floor	Gray/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
114 *322118209-0114*	Lower floor-int - Vinyl wood floor-beige/Technical services-floor	Gray/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
115 *322118209-0115*	Lower floor-int - Vinyl wood floor-beige/Technical services-floor	Brown/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
116 *322118209-0116*	Lower floor-int - VWF mastic(assoc 113-115)Technical services-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
117 *322118209-0117*	Lower floor-int - VWF mastic(assoc 113-115)Technical services-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
118 *322118209-0118*	Lower floor-int - VWF mastic(assoc 113-115)Technical services-floor	Black/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
119 *322118209-0119*	Lower floor-int - Vinyl wood floor-brown/Staff lounge-floor	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
120 *322118209-0120*	Lower floor-int - Vinyl wood floor-brown/Staff lounge-floor	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
121 *322118209-0121*	Lower floor-int - Vinyl wood floor-brown/Staff lounge-floor	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
122 *322118209-0122*	Lower floor-int - VWF mastic(assoc 119-121)Staff lounge-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
123 *322118209-0123*	Lower floor-int - VWF mastic(assoc 119-121)Staff lounge-floor	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
124 *322118209-0124*	Lower floor-int - VWF mastic(assoc 119-121)Staff lounge-floor	Yellow/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
125 *322118209-0125*	Lower floor-int - Baseboard(4 in)beige/Hallway-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
126 *322118209-0126*	Lower floor-int - Baseboard(4 in)beige/Hallway-wall	White/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
127 *322118209-0127*	Lower floor-int - Baseboard(4 in)beige/Hallway-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
128 *322118209-0128*	Lower floor-int - Baseboard mastic(assoc 125-127)Hallway-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
129 *322118209-0129*	Lower floor-int - Baseboard mastic(assoc 125-127)Hallway-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
130 *322118209-0130*	Lower floor-int - Baseboard mastic(assoc 125-127)Hallway-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
131 *322118209-0131*	Lower floor-int - Baseboard(4 in)brown/Technical serv-wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
132 *322118209-0132*	Lower floor-int - Baseboard(4 in)brown/Technical serv-wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing
520 Mission Street South Pasadena, CA 91030
Tel/Fax: (323) 254-9960 / (323) 254-9982
http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order: 322118209
Customer ID: 32ATCA45
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
133 *322118209-0133*	Lower floor-int - Baseboard(4 in)brown/Technical serv-wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
134 *322118209-0134*	Lower floor-int - Baseboard mastic(assoc 131-133)Technical serv-wall	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
135 *322118209-0135*	Lower floor-int - Baseboard mastic(assoc 131-133)Technical serv-wall	White/Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
136 *322118209-0136*	Lower floor-int - Baseboard mastic(assoc 131-133)Technical serv-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
137 *322118209-0137*	Lower floor-int - Plaster/hallway-wall	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
138 *322118209-0138*	Lower floor-int - Plaster/library storage-wall	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
139-Finish Coat *322118209-0139*	Lower floor-int - Plaster/technical services-wall	White Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
139-Base Coat *322118209-0139A*	Lower floor-int - Plaster/technical services-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
140 *322118209-0140*	Lower floor-int - CMU mortar/storage library-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
141 *322118209-0141*	Lower floor-int - CMU mortar/hallway @ lockers-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
142 *322118209-0142*	Lower floor-int - CMU mortar/technical services-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
143 *322118209-0143*	Lower floor-int - Interior stucco/men's restroom-ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
144-Finish Coat *322118209-0144*	Lower floor-int - Interior stucco/hallway @ exit-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
144-Base Coat *322118209-0144A*	Lower floor-int - Interior stucco/hallway @ exit-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
145 *322118209-0145*	Lower floor-int - Interior stucco/hallway @ lockers-wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
146-Finish Coat *322118209-0146*	Lower floor-int - Interior stucco/technical services-wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 10/05/2021 19:04:37

LA Testing

520 Mission Street South Pasadena, CA 91030

Tel/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322118209
Customer ID:	32ATCA45
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
146-Base Coat *322118209-0146A*	Lower floor-int - Interior stucco/technical services-wall	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
147-Finish Coat *322118209-0147*	Lower floor-int - Interior stucco/library storage-ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
147-Base Coat *322118209-0147A*	Lower floor-int - Interior stucco/library storage-ceiling	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
148 *322118209-0148*	Roof - Penetrating mastic column support-column	White/Black Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
149 *322118209-0149*	Roof - Penetrating mastic column support-column	White/Black Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
150 *322118209-0150*	Roof - Penetrating mastic column support-column	Brown/White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
151 *322118209-0151*	Roof - Rolled-on roofing asphalt/roof-north	Gray/White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
152 *322118209-0152*	Roof - Rolled-on roofing asphalt/roof-east	Gray/White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
153 *322118209-0153*	Roof - Rolled-on roofing asphalt/roof-west	Gray/White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
154 *322118209-0154*	Roof - Vent mastic/roof-vent HVAC	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
155 *322118209-0155*	Roof - Vent mastic/roof-vent HVAC	Brown/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
156 *322118209-0156*	Roof - Vent mastic/roof-vent HVAC	Brown/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Humberto Espinoza Bajo (60)

Tania Lopez (108)

Jerry Drapala Ph.D, Laboratory Manager
or Other Approved Signatory

LA Testing maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by LA Testing. LA Testing bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore LA Testing recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by LA Testing South Pasadena, CA NVLAP Lab Code 200232-0, CA ELAP 2283

Initial report from: 10/05/2021 19:04:37

OrderID: 322118209

LATesting
520 Mission Street

South Pasadena, CA 91030
PHONE: 1-800-303-0047
FAX: 323-254-9982

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*:

#322118209

Company Name : ATC Group Services dba Atlas Technical		**EMSL Customer ID:**	
Street: 1180 Durfee Avenue, Suite 125		**City:** South El Monte	**State/Province:** CA
Zip/Postal Code: 91733	**Country:** US	**Telephone #:** 323-517-9780	**Fax #:**
Report To (Name): Stephen Drengson		**Please Provide Results:** ☐ Fax ☑ Email	
Email Address: stephen.drengson@oneatlas.com		**Purchase Order:**	
Project Name/Number: 1011602022 P1 Altadena		**EMSL Project ID** *(Internal Use Only)*:	
U.S. State Samples Taken: CA		**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt	

EMSL-Bill to: ☑ Same ☐ Different - If Bill to is Different note instructions in Comments**
Third Party Billing requires written authorization from third party

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ■ 72 Hour | ☐ 96 Hour | ☐ 1 Week | ☐ 2 Week

**For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

PCM - Air ☐ Check if samples are from NY
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- ☑ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NYS 198.8 SOF-V
- ☐ NIOSH 9002 (<1%)

TEM – Air ☐ **4-4.5hr TAT (AHERA only)**
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312

TEM - Bulk
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm ☐ Waste ☐ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- ☐ PLM EPA 600/R-93/116 with milling prep (<1%)
- ☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
- ☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
- ☐ TEM Qualitative via Filtration Prep
- ☐ TEM Qualitative via Drop Mount Prep
- ☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

Other:
- ☐

☐ Check For Positive Stop – Clearly Identify Homogenous Group

Filter Pore Size (Air Samples): ☐ 0.8µm ☐ 0.45µm

Samplers Name: Roberto de la Torre

Samplers Signature:

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
	See Attached		

Client Sample # (s): 001-156 - **Total # of Samples:** 156

Relinquished (Client): **Date:** 9-30-21 **Time:**

Received (Lab): **Date:** 09/30/2021 **Time:** 11am

Comments/Special Instructions:

BillTo: ATC Group Services LLC, 1180 Durfee Avenue, Suite 125, South El Monte, CA, 91733, United States
Attention: Stephen Drengson Phone: 323-517-9780 Email: stephen.drengson@oneatlas.com

Page 1 of 1 pages

#322118209

BULK SAMPLE LOG

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 1 OF 8

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
01	Main Floor - Interior		
02	Mid Floor - Interior		
03	Lower Floor - Interior		

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION	
001	Main	01	61	Carpet Mastic (Under Green) 2'x2' Fiction Area (Opp. Corner of Children's Books - Floor (Main)	900 SF
002				Near Info Desk / Public Copier - Floor	
003				Librarian Office - Floor	
004			61	Carpet Mastic (Under Blue) 2'x2' (Main) Near Children's Books - Floor	3000
005				Family Service Desk - Floor	
006				Near Restrooms Floor	
007			61	Carpet Mastic (Under Orange) 2'x2' West Section - Floor (Main Area)	1200
008				-	
009				-	
010			34	Wood Blank (Green) Vinyl Magazine Area - North End - Floor (Main)	480
011				-	
012				Near Elevator - Floor	
013			35	Vinyl Wood Plank Mastic (Assoc. 010-012) Magazine Area - North End - Floor (Main)	480
014					
015				Near Elevator - North End - Floor	
016			34	Vinyl Wood Plank (Blue) Near Children & Family Serv. Desk - Floor (Main)	290
017				-	
018				-	
019			35	VWP Mastic (Assoc. 016-018) Near Children & Family Serv. Desk - Floor (Main)	290
020				-	

MATERIAL CODES (SEE RIGHT)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING GAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

OrderID: 322118209

#3221182O9
BULK SAMPLE LOG

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 2 OF 8

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
01	Main Floor - Interior		

SAMPLE #	BLDG/FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION		
021	Main	35	01	Vinyl Wood Planks (Orange)	330	SF
022		34		NW Section - Floor (Main Area)		
023				-		
024				-		
025		35		VWP - Mastic (Assoc. 022-024)	330	
026				NW Section - Floor (Main Area)		
027				-		
028		34		-		
029				Vinyl Wood Planks (Brown)	1000	
030				Main Area - Near Stairs		
031		35		- Reception Office Area		
032				- Circulation		
033				VWP Mastic (Assoc. 028-030)	1000	
034		31		Main Area - Near Stairs		
035				- Reception Office Area		
036				- Circulation		
037		32		Vinyl Floor Tile (9"x9") Off White w/Brown Smudges	400	
038				Circulation Rm - Floor		
039				-		
040		52		Janitor Rm -		
				VFT Mastic (Assoc. 034-036)	400	
				Circulation Rm - Floor		
				- Floor		
				Janitor Rm - Floor		
				Ceramic Floor Tile Mortar	100	
				Men's Restroom - Floor		

MATERIAL CODES (SEE RIGHT)

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING CAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

OrderID: 3221182O9

#3221182O9

BULK SAMPLE LOG

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 3 OF 8

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
01	Main Floor - Interior		
02	Mid Floor - Interior		
03	Lower Floor - Interior		

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION		
041	Mid		52	Men's Restroom - Floor		SF
042	Lower			Women's Restroom -		
043	Main		36	Baseboard (4 in) Librarian Office - Wall	450	LF
044				Main Area (Near RR) -		
045				Circulation -		
046			37	Baseboard Usage (Assoc. 043-045) Librarian Office - Wall		
047				Main Area (Near RR -		
048				Circulation -		
049			66	Interior Stucco Interior Main Area - South Ceiling	4500	SF
050				- Column South		
051				- Column West		
052				- Ceiling North		
053				- Ceiling East		
054			20	Plaster Main Area - Outside Men's RR - Wall	1500	
055				- Outside Women's RR - Wall		
056				Circulation Rm - Janitor Room - Wall		
057				Women's RR - Ceiling		
058				Men's RR - Ceiling		
059			67	Cast Mortar SW Section - Wall	5000	
060				Librarian - Wall - East		

MATERIAL CODES (SEE RIGHT)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING GAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

66 Interior Stucco
67 Cast Mortar

OrderID: 3221182O9

#322118209
BULK SAMPLE LOG

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

OrderID: 322118209

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 4 OF 8

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
01	Main Floor - Int.		
02	Mid Floor - Int.		
03	Lower Floor - Int.		

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION		
061	Main	01		Main Area (Near Elevator) - Wall		
062	Mid	02	34	Vinyl Wood Plank (Grey) Foyer - Floor	150	SF
063				-		
064				-		
065			35	VWP Mastic (Assoc. Foyer - Floor	150	
066				-		
067				-		
068			31	Vinyl Floor Tile 9x9 (Beige) Electric Room - Floor	1000	
069				-		
070				Storage Closet -		
071			32	VFT Mastic (Assoc 068-070) Electric Rm - Floor	1000	
072				-		
073				Storage Closet -		
074			61	Carpet Mastic Foyer Steps - Steps	150	
075				-		
076				-		
077			36	Baseboard (4in) Beige Electric Room - Wall	80	LF
078				Storage Closet -		
079				Stage -		
080			37	Baseboard Mastic (Assoc. 77-79) Electric Rm - Wall	80	

MATERIAL CODES (SEE RIGHT)

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING CAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRICIROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

#3221182O9
BULK SAMPLE LOG

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 5 OF 8

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
01	Main Floor - Int.		
02	Mid Floor - Int.		
03	Lower Floor - Int.		

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION		
081	Mid	02		Storage Closet - Wall	4	LF
082				Stage		
083			36	Baseboard (4in) Brown Community Rm - Wall	100	
084						
085						
086			37	Baseboard Mastic (Assoc. 083-085) Community Rm - Wall	100	
087						
088						
089			66	Interior Stucco Foyer - Wall	200	SF
096						
091						
092	Main	01	52	Wall Tile Mortar Men's Restroom - Wall	1500	SF
093	Mid	02				
094	Lower	03		Women's RR		
095	Main	01	53	Wall Tile Grout Men's Restroom - Wall	1500	
096	Mid	02				
097	Lower	03		Women's RR		
098			31	Vinyl Floor Tile (9"x9") White w/ Red Smudges Hallway - Floor	500	
099						
100						

MATERIAL CODES (SEE RIGHT)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING CAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

OrderID: 3221182O9

#322118209
BULK SAMPLE LOG

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 6 OF 8

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
03	Lower Floor - Int.		

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION	
101	Lower	03	32	VFT Mastic (Assoc. 098-100) Hallway - Floor	500 SF
102				-	
103				-	
104			34	Vinyl Sheet Flooring Storage Room - Floor	200
105				-	
106				-	
107			35	VSF Mastic (Assoc. 104-106) Storage Room - Floor	200
108				-	
109				-	
110			6P	Flooring Felt (Assoc. 104-106) Storage Rm - Floor	200
111				-	
112				-	
113			34	Vinyl Wood Floor - Beige Technical Services - Floor	1200
114				-	
115				-	
116			35	VWF Mastic (Assoc. 113-115) Technical Services - Floor	1200
117				-	
118				-	
119			34	Vinyl Wood Floor - Brown Staff Lounge - Floor	240
120				-	

MATERIAL CODES (SEE RIGHT)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING CAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

63 Floor Felt

OrderID: 322118209

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001 PAGE 7 OF 8

#3221182O9
BULK SAMPLE LOG

PROJ. NO.: 1011602022 PHASE NO.: 1 DATE: 092821

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

CLIENT: ALTADENA LIB.

EVALTR: R. de la TORRE

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
03	Lower Floor - Int.		

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION		
121	Lower	03		Staff Lounge - Floor		SF
122			35	W/F Mastic (Assoc. 119-121) Staff Lounge - Floor	240	
123				-		
124				-		
125			36	Baseboard (4in) Beige Hallway - Wall	150	LF
126				-		
127				-		
128			37	Baseboard Mastic (Assoc. 125-127) Hallway - Wall	150	LF
129				-		
130				-		
131			36	Baseboard (4 in) Brown Technical Serv. - Wall	120	
132				-		
133				-		
134			37	Baseboard Mastic (Assoc. 131-133) Technical Serv. - Wall	120	
135				-		
136				-		
137			20	Plaster Hallway - Wall	2000	SF
138				Library Storage -		
139				Technical Services -		
140			67	Cotty Mortar Storage Library - Wall	1500	

MATERIAL CODES (SEE RIGHT)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING CAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

OrderID: 3221182O9

#322118209
BULK SAMPLE LOG

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

PROJECT: ALTADENA MAIN LIBRARY
ADDRESS: 600 E MARIPOSA ST. ALTADENA, CA 91001
PAGE 8 OF 8
PROJ. NO.: 1011602022
PHASE NO.: 1
DATE: 092821
CLIENT: ALTADENA LIB.
EVALTR: R. de la TORRE

AREA	AREA NAME/DESCRIPTION
04	Roof
03	Lower Floor - Int.

SAMPLE #	BLDG./FLOOR	AREA	MTR CODE	MATERIAL DESCRIPTION	
141	Lower	03		Hallway @ Lockers - Wall	
142				Technical Services -	
143			66	Interior Stucco	4000 SF
144				Men's Restroom - Ceiling	
145				Hallway @ Exit - Wall	
146				Hallway @ Lockers -	
147				Technical Services -	
148	Roof	04	48	Library Storage - Ceiling Penetrating Mastic Column Support - Column	200 SF
149					
150					
151			44	Rolled-On Roofing Asphalt Roof - North	3500 SF
152				- East	
153				- West	
154				Vent Mastic Roof - Vent HVAC	200 LF
155					
156					

UNIT CODES
LF LINEAR FEET
SF SQUARE FEET
EA EACH

MATERIAL CODES (SEE RIGHT)

CONDITION CODES
1 GOOD
2 DAMAGED
3 SIGNIFICANTLY DAMAGED

IF DAMAGED
1 LOCALIZED
2 DISTRIBUTED

PERCENT DAMAGE (%)
01 - 99

01 BOILER INSULATION
02 BOILER LAGGING
03 BREECHING INSULATION
04 BREECHING LAGGING
05 CHILLER INSULATION
06 CHILLER LAGGING
07 STORAGE TANK INSUL
08 STORAGE TANK LAGGING
09 PUMP HOUSING INSULATION
10 PUMP HOUSING LAGGING
11 GASKETRY
12 FUEL INSULATION
13 TRANSITE PIPE
14 PIPE FITTING INSULATION
15 PIPE FITTING LAGGING
16 PIPE RUN INSULATION
17 PIPE RUN LAGGING
18 PLASTER BROWN/SCRATCH
19 PLASTER FINISH COAT
20 PLASTER COMPOSITE
21 WALLBOARD
22 JOINT COMPOUND
23 PAINT/COATING
24 ACOUSTIC SPRAY-ON MAT'L
25 ACOUSTIC PANEL
26 ACOUSTIC PANEL (2'X2')
27 ACOUSTIC PANEL (2'X4')
28 ACOUSTIC TILE (1'X1')
29 ACOUSTIC TILE (1'X2')
30 ACOUSTIC TILE MASTIC
31 FLOOR TILE (9"X9")
32 FLOOR TILE (12"X12")
33 FLOOR TILE MASTIC
34 RESILIENT SHEET FLOORING
35 SHEET FLOORING MASTIC
36 BASEBOARD
37 BASEBOARD MASTIC
38 FIREPROOFING - SPRAY-ON
39 HVAC FLEXIBLE CONNECTOR
40 DUCT INSULATION
41 DUCT INSULATION LAGGING
42 DUCT SEAM TAPE
43 ROOFING COMPOSITE (ROOF CUT)
44 ROOFING CAP SHEET
45 ROOFING SHINGLE
46 ROOFING FLASHING
47 ROOFING FELT
48 ROOFING MASTIC
49 THERMAL INSULATION
50 HEAT SHIELD
51 TRANSITE SHEET MAT'L
52 MORTAR
53 GROUT
54 SINK UNDERCOAT MATERIAL
55 WALL PAPER
56 FABRIC/ROPE
57 WOOD FLOOR MASTIC
58 FIRE-RATED/INSULATED DOOR CORE
59 EXTERIOR STUCCO
60 ROOF PENETRATION MASTIC
61 CARPET MASTIC
63 WINDOW PUTTY
64 DUCT MASTIC
65 ACROVYNE MASTIC
66 OTHER (DESCRIBE)

OrderID: 322118209

APPENDIX III
Lead Laboratory Analytical Report, Sample Logs, XRF Logs, & CDPH Form 8552

LA Testing
5431 Industrial Drive, Huntington Beach, CA 92649
Phone/Fax: (714) 828-4999 / (714) 828-4944
http://www.LATesting.com gardengrovelab@latesting.com

LA Testing Order: 332122764
CustomerID: 32ATCA45
CustomerPO:
ProjectID:

Attn: **Stephen Drengson**
Atlas Technical
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733

Phone: (323) 517-9780
Fax: (323) 517-9781
Received: 10/1/2021 12:00 PM
Collected: 9/28/2021

Project: **1011602022 P1 Altadena**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	*Collected*	*Analyzed*	*Weight*	*RDL*	*Lead Concentration*
P01	9/28/2021	10/5/2021	0.264 g	80 ppm	1200 ppm
332122764-0001	Site: Library roof - roof - white paint chip roof - slats - metal				
P02	9/28/2021	10/5/2021	0.2573 g	80 ppm	1300 ppm
332122764-0002	Site: Library roof - roof - red paint chip - fascia - metal roof - fascia - metal				

Michael Chapman

Michael Chapman, Laboratory Manager
or other approved signatory

LA Testing maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by LA Testing. LA Testing bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.
Analysis following Lead in Paint by LA Testing SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.
Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC--ELLAP Accredited #101650, CA ELAP 1406

Initial report from 10/05/2021 08:47:02

OrderID: 332122764

LATesting
5431 Industrial Drive

Huntington Beach, CA 92649
PHONE: (714) 828-4999
FAX: (714) 828-4944

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only)*:

#332122764

Company : ATC Group Services LLC dba Atlas Technical		**EMSL-Bill to:** ☐ Different ☑ Same If Bill to is Different note instructions in Comments**	
Street: 1180 Durfee Avenue, Suite 125		*Third Party Billing requires written authorization from third party*	
City: South El Monte	**State/Province:** CA	**Zip/Postal Code:** 91733	**Country:** US
Report To (Name): Stephen Drengson		**Telephone #:** 323-517-9780	
Email Address: stephen.drengson@oneatlas.com		**Fax #:**	**Purchase Order:**
Project Name/Number: 1011602022 P1 Altadena		**Please Provide Results:** ☐ FAX ☑ E-mail ☐ Mail	
U.S. State Samples Taken: CA		**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ % by wt. ☐ mg/cm² ■ ppm	SW846-7000B	Flame Atomic Absorption	0.01%	x
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	☐
Wipe* ASTM ☐ non ASTM ☐ *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	☐
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	☐
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	☐
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	☐
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	☐
Wastewater Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	☐
Drinking Water Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	☐
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	☐
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	☐
Other:				☐

Name of Sampler: R. de la Torre **Signature of Sampler:**

Sample #	Location	Volume/Area	Date/Time Sampled
	See Attached		

Client Sample #'s P01 - P02 **Total # of Samples:** 2

Relinquished (Client): **Date:** 9-28-21 **Time:**

Received (Lab): **Date:** 09/30/21 **Time:** 1100

Comments:

BillTo: ATC Group Services LLC, 1180 Durfee Avenue, Suite 125, South El Monte, CA, 91733, United States
Attention: Stephen Drengson Phone: 323-517-9780 Email: stephen.drengson@oneatlas.com

Per Stephen 48HR TAT

EM(PU)
10/1/21 12PM

#332122764

LEAD BULK SAMPLE LOG

PROJECT: ALTADENA MAIN LIBRARY ADDRESS: 600 E. MARIPOSA ST. ALTADENA, CA 91001 PAGE 1 OF 1

PROJECT NO. 101160202 PHASE NO. 1 DATE: 092821

CLIENT: ALTADENA

SURVEYOR(S): R. de la TORRE

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

AREA	AREA NAME/DESCRIPTION	AREA	AREA NAME/DESCRIPTION
01	Roof		

SAMPLE #	BLDG./FLOOR	AREA	COM'T CODE	COLOR	MATERIAL DESCRIPTION	ESTIMATED QUANTITY	UNIT CODES
P01	Library Roof	01	43	White	Paint Chip - Roof - Slats - Metal	900	SF
P02	↓	↓	44	Red	Paint Chip - Fascia - Metal Roof - Fascia - Metal	1200	↓

UNIT CODES: LF LINEAR FEET; SF SQUARE FEET; EA EACH

01 RADIATOR
02 ACCESS HATCH
03 DOOR, HEADER
04 DOOR JAM
05 DOOR, CASING
06 STAIR, TREADS
07 STAIR, RISERS
08 STAIR, STRINGER
09 BALUSTER
10 RAILING CAP
11 NEWEL POST
12 WINDOW, HEADER
13 WINDOW, CASING
14 WINDOW, SILL
15 WINDOW, SASH
16 WINDOW, STOPS
17 MULLIONS
18 APRON
19 WINDOW GRATE
20 DOOR GRATE
21 BASEBOARD
22 WALLS
23 WALLS, LOWER
24 WALLS, UPPER
25 CHAIR RAIL
26 DOOR, EXTERIOR
27 EXTERIOR, DOOR CASING
28 EXTERIOR, WINDOW CASING
29 EXTERIOR, WINDOW MULLIONS
30 EXTERIOR, WINDOW SILL
31 THRESHOLD
32 DRIPBOARD
33 LOWER TRIM
34 UPPER TRIM
35 CORNERBOARD
36 SIDING
37 CELLAR WINDOW UNIT
38 FLOOR
39 RAILING CAPS
40 SUPPORT COLUMN
41 JOIST
42 CEILING
43 OTHER (DESCRIBE) 43. Slats
44. Fascia

PEELING CODE: 1 PEELING; 2 NOT PEELING; 3 UNDAMAGED; 4 CHIPPED; 5 CHAULKING

SUBSTRATE CODE: 1 WOOD; 2 METAL; 3 MASONRY; 4 DRYWALL; 5 PLASTER; 6 OTHER (DESCRIBE)

CHEWABLE SURFACE: 1 YES; 2 NO

CONTACT CODE: 1 LOW; 2 MODERATE; 3 HIGH

CODE: 1 ____ 2 ____ 3 ____

OrderID: 332122764

XRF LEAD BASED PAINT SURVEY

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
01	—	Start Calibration	—	—	—	—	—	—	1.0
02	—	↓	—	—	—	—	—	—	0.9
03	—	↓	—	—	—	—	—	—	1.0
04	—	↓	—	—	—	—	—	—	1.0
05	—	↓	—	—	—	—	—	—	0.9
06	—	↓	—	—	—	—	—	—	0.9
07	—	↓	—	—	—	—	—	—	0.0
08	Main	NW Stacks Area			N	Column	Concrete	Green	0.4
09	↓	↓			W	↓	↓	↓	0.3
10	↓	↓			C	↓	↓	↓	0.5
11	↓	SW Stacks Area			W	Door	Metal	Beige	0.1
12	↓	↓			C	Column	Concrete	Green	0.5
13	↓	SE Restroom (Women's)	I	250 SF	E	Wall	Ceramic	White	16.9
14	↓	↓			C	Floor	↓	↓	0.4
15	↓	↓			S	Stall	Metal	Yellow	0.1

COMMENTS: Note: #13 represent Women's and Men's RR.

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

XRF LEAD BASED PAINT SURVEY

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
16	Main	SE RR Women's			E	Sink	Porcelain	White	0.1
17	↓	SE ↓			↓	Toilet	↓	↓	0.0
18		SE RR Mn's			N	Sink	Porc.	White	0.0
19		↓			↓	Urinal	↓	↓	0.1
20		↓			↓	Toilet	↓	↓	0.2
21		↓	I	250SF	N	Wall Tile	Ceramic	WH.	16.9
22		↓			C	Floor Tile	Ceramic	Beige	0.5
23		Service Desk Area			E	Wall	Plaster	WH.	0.1
24		Secretary			W	↓	↓	↓	0.2
25		Librarian Off.			W	↓	↓	↓	0.1
26		Lib. Off. RR			W	Sink	Porc.	WH.	0.0
27		↓			↓	Toilet	↓	↓	0.2
28		↓			S	Wall	WB	O-WH.	0.0
29		Adult Services			N	Wall	Plaster	WH.	0.1
30	↓	↓			S	↓	↓	↓	0.1

COMMENTS:

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

XRF LEAD BASED PAINT SURVEY

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
31	Main	Circulation			N	Wall	Plaster	Wht.	0.1
32	↓	Janitor Rm.			E	Metal Panel	Metal	Wht.	0.2
33	↓	Circulation			N	Door	↓	↓	0.0
34	↓	Sunk-in Space #1			C	Floor Tile	Ceramic	Lt. Brown	0.5
35	↓	↓ #2			↓	↓	↓	↓	0.0
36	↓	Light Posts			C	Pole	Metal	Brown	0.3
37	↓	Elevator			E	Door	Metal	Brown	0.3
38	Mid	Community Room			S	Door	Wood	Varnish	0.1
39	↓	Closet			C	Ceiling	Plaster	Wht.	0.1
40	↓	Stage Steps			N	Steps	Wood	Yellow	0.2
41	↓	Stage			N	Wall	Plaster	Wht.	0.1
42	↓	↓			W	Door	Metal	Wht.	0.1
43	↓	↓			↓	D. Trim	↓	O-wht.	0-2
44	↓	Lighting Rm			S	Wall	Plaster	Wht.	0.1
45	↓	Kitchen Unit Console			S	Kitchen Unit	Cast Iron	Yellow	0.0

COMMENTS:

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

XRF LEAD BASED PAINT SURVEY

ATLAS
1160 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
46	Mid	Women's RR	I	240 SF	E	Wall Tile	Ceramic	WH.	16.9
47	↓	↓			C	Floor Tile	Ceramic	Brown	0.3
48					N	Sink	Porc.	WH.	0.1
49					↓	Toilet	↓	↓	0.2
50					↓	↓	↓	↓	0.1
51		Men's RR	I	240 SF	N	Wall Tile	Ceramic	WH.	16.8
52		↓			C	Floor Tile	↓	WH.	0.2
53					N	Sink	Porc.	↓	0.0
54					↓	Urinal	↓		0.0
55	↓	↓			↓	Toilet	↓	↓	0.0
56	Lower	Technical Services			SW	Column	Concrete	Blue	0.2
57	↓	↓			C	Column	Concrete	Blue	0.3
58					E	Wall	Plaster	Blue	0.2
59					E	Door Frame	Metal	Brown	0.6
60	↓	↓			C	Ceiling	Concrete	WH.	0.2

COMMENTS:

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

XRF LEAD BASED PAINT SURVEY

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
61	Lower	Hall RR - Men's	I	200 SF	N	Ceramic	Wall	WH.	15.1
62	↓	↓			C	Floor Tile	Ceramic	Brown	0.3
63					E	Sink	Porc.	WH.	0.1
64					E	Toilet	↓	↓	0.0
65		Hall RR - Women's	I	200 SF	N	Ceramic	Wall	WH.	16.3
66		↓			C	Floor Tile	Ceramic	Beige	0.3
67					W	Sink	Porc.	WH.	0.0
68					W	Toilet	↓	↓	0.1
69		Hallway			N	Wall	Plaster	Blue	0.1
70		↓			S	↓	↓	↓	0.1
71					S	Exit Door	Metal	Beige	0.2
72		Art Room			N	Door Frame	Metal	Brown	0.5
73		↓			N	Wall	Plaster	WH.	0.1
74					S	Door	Metal	Blue	0.1
75	↓	↓			E	Wall	Plaster	WH.	0.1

COMMENTS:

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

XRF LEAD BASED PAINT SURVEY

ATLAS
1180 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-6760

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
76	Lower	Janitor			S	Wall	Plaster	O-WH.	0.0
77	↓	↓			S	D. Frame	Metal	Brown	0.1
78					N	Wall	Concrete	WH	0.4
79		Staff Lounge			N	Kitchen Unit	Cast Iron	Yellow	0.3
80		↓			W	Wall	Plaster	O-WH.	0.1
81		↓			N	↓	↓	↓	0.1
82		↓			E	Wall	Concrete	O-WH.	0.1
83		Store Room			S	Door frame	Metal	Brown	0.5
84		Hallway			S	Lockers	Metal	Brown	0.1
85		Elevator			W	Door	Metal	Brown	0.2
86		Exterior - Post Office			S	Door	Metal	Yellow	0.1
87		↓			S	Column	Concrete	Yellow	0.1
88		↓			W	Stairs	Metal	Red	0.3
89		- Elec. Room			W	Door	Metal	Yellow	0.0
90	↓	↓			W	Door	Glass	Clear	0.0

COMMENTS:

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

XRF LEAD BASED PAINT SURVEY

ATLAS
1183 Durfee Avenue, Suite 125
South El Monte, CA 91733
(323) 517-9780

Date: 9/28/21 Client: ALTADENA LIBRARY DISTRICT Spectrum Analyzer ID #: H 1706

Project No.: 1011602022 Survey Location: 600 E. MARIPOSA ST. ALTADENA CA 91001

Phase No.: 1 Inspector(s): R. de la TORRE

Sample No.	Floor	Room / Area	Condition Of Paint	Quantity Of Lead	Location N,E,S,W	Surface	Substrate	Color	Result (mg / cm²)
91	Ground	Exterior			W	Ladder	Metal	Black	0.1
92	↓	↓			W	Panel	↓	Black	0.5
93					S	Gate	Metal	Red	0.2
94					E	Wall	Stucco	WH.	0.0
95			I	150LF	E	Bridge	Metal	Purple	0.7
96	Roof	Ext. White Slats			N	Slats	Metal	WH.	0.2
97	↓	↓ Red Fascia			E	Fascia	↓	Red	0.2
98	—	End Calibration	—	—	—	—	—	—	1.0
99	—	↓	—	—	—	—	—	—	1.0
100	—		—	—	—	—	—	—	0.9
101	—		—	—	—	—	—	—	0.9
102	—		—	—	—	—	—	—	0.9
103	—		—	—	—	—	—	—	1.0
104	—	↓	—	—	—	—	—	—	0.0

COMMENTS:

CONDITION OF PAINT:
I INTACT
F FAIR - Small Amount Flaking
P POOR - Large Amounts Flaking

State of California—Health and Human Services Agency | California Department of Public Health

LEAD HAZARD EVALUATION REPORT

Section 1 — Date of Lead Hazard Evaluation 9/28/21

Section 2 — Type of Lead Hazard Evaluation (Check one box only)

☑ Lead Inspection ☐ Risk assessment ☐ Clearance Inspection ☐ Other (specify) _____

Section 3 — Structure Where Lead Hazard Evaluation Was Conducted

Address [number, street, apartment (if applicable)]	City	County	Zip Code
600 East Mariposa Street	Altadena	Los Angeles	91001

Construction date (year) of structure	Type of structure	Children living in structure?
1967	☐ Multi-unit building ☐ School or daycare ☐ Single family dwelling ☑ Other Library	☐ Yes ☑ No ☐ Don't Know

Section 4 — Owner of Structure (if business/agency, list contact person)

Name	Telephone number
Altadena Library District c/o Rachlin Partners / Jennifer Pearson	310-204-3400

Address [number, street, apartment (if applicable)]	City	State	Zip Code
8640 National Boulevard	Culver City	California	90232

Section 5 — Results of Lead Hazard Evaluation (check all that apply)

☑ No lead-based paint detected ☐ Intact lead-based paint detected ☐ Deteriorated lead-based paint detected

☐ No lead hazards detected ☐ Lead-contaminated dust found ☐ Lead-contaminated soil found ☑ Other Ceramic Tile

Section 6 — Individual Conducting Lead Hazard Evaluation

Name	Telephone number
Atlas Technical / Steve Drengson	323-517-9780

Address [number, street, apartment (if applicable)]	City	State	Zip Code
1180 Durfee Avenue, Suite 125	South El Monte	California	91733

CDPH certification number	Signature	Date
LRCIA #LRC4394		10/13/21

Name and CDPH certification number of any other individuals conducting sampling or testing (if applicable)

Roberto de la Torre - LRCIA #LRC4610, Max Quezada LRCIA #LRC1986

Section 7 — Attachments

A. A foundation diagram or sketch of the structure indicating the specifc locations of each lead hazard or presence of lead-based paint;
B. Each testing method, device, and sampling procedure used;
C. All data collected, including quality control data, laboratory results, including laboratory name, address, and phone number.

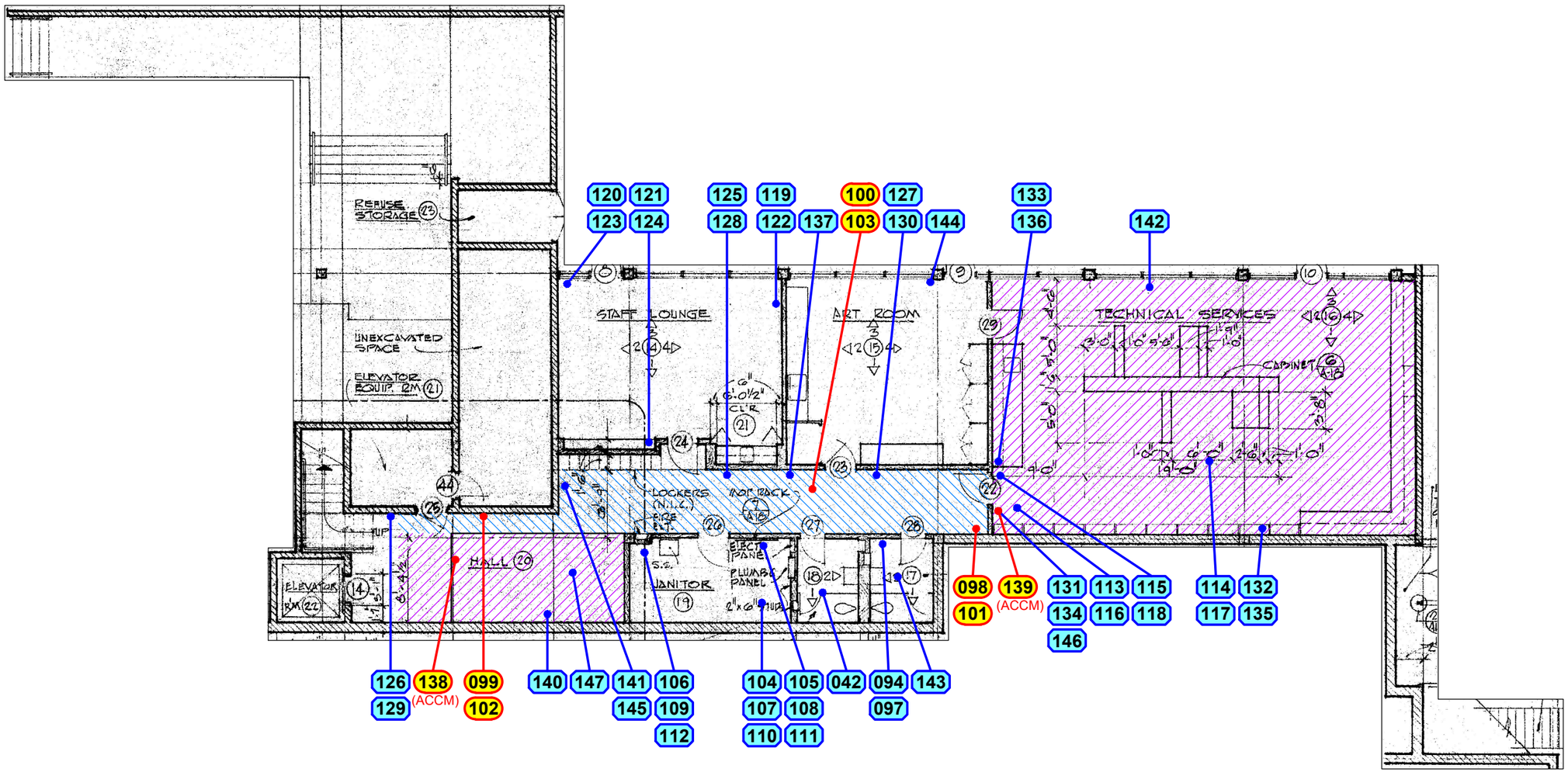
First copy and attachments retained by inspector

Second copy and attachments retained by owner

Third copy only (no attachments) mailed or faxed to:

California Department of Public Health
Childhood Lead Poisoning Prevention Branch Reports
850 Marina Bay Parkway, Building P, Third Floor
Richmond, CA 94804-6403
Fax: (510) 620-5656

APPENDIX IV
Site Diagrams



LEGEND:

- 001 — ACM SAMPLE LOCATION
- 000 — POSITIVE ACM SAMPLE LOCATION
- 2,000 SF. ACCM PLASTER
- 500 SF. ACM 9"x9" WHITE WITH RED SMUDGED VINYL FLOOR TITLE AND ASSOCIATED MASTIC

N

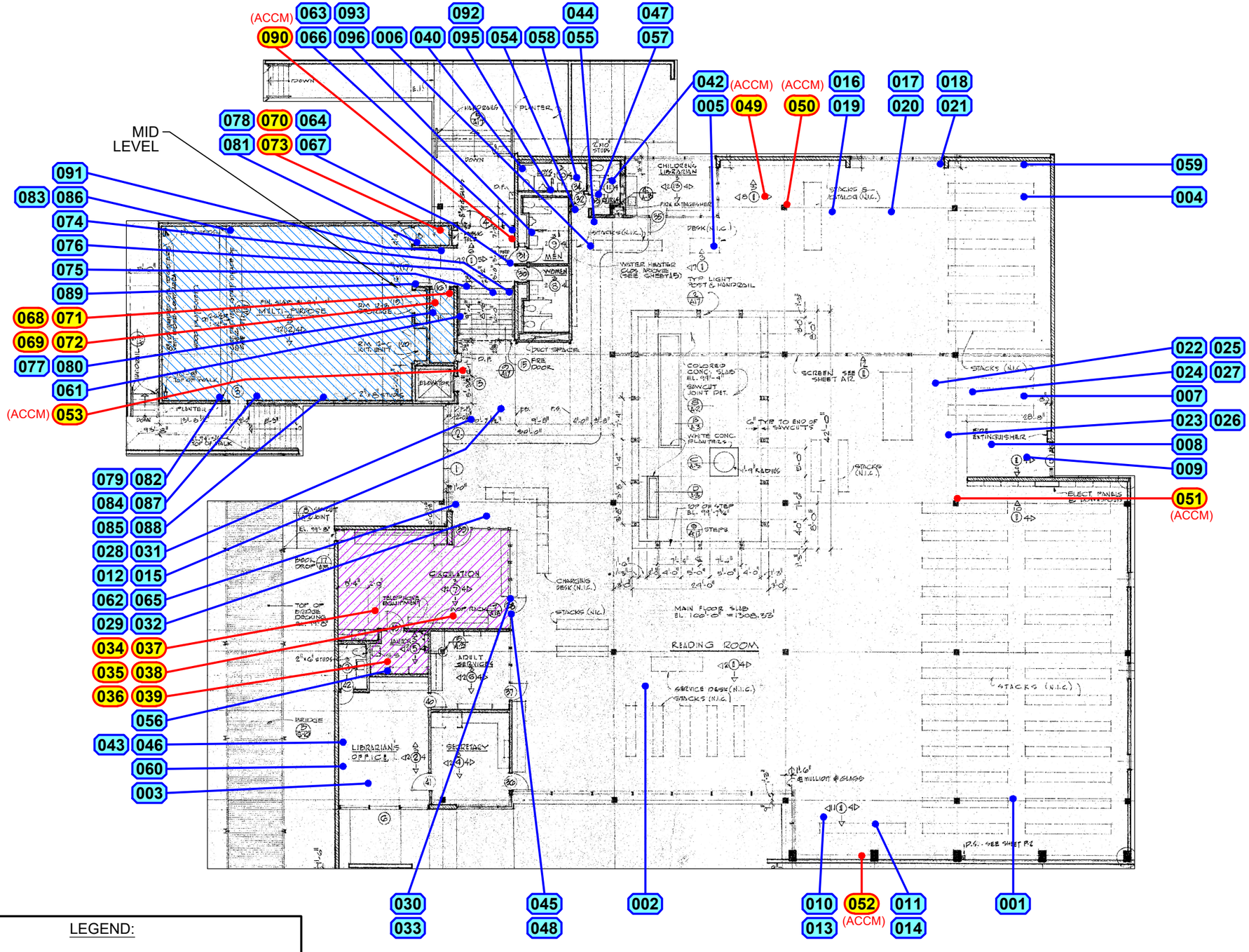
NOT TO SCALE

ASBESTOS SURVEY
LOWER LEVEL FLOOR PLAN

ALTADENA LIBRARY DISTRICT
600 EAST MARIPOSA STREET
ALTADENA, CALIFORNIA 91001

Project Number: 1011602022	
Date: 10/13/2021	
Drn. By: AK	Ckd. By: SD
Scale: AS SHOWN	
Figure: 1	

H:\2021\OTHER OFFICES\CALIFORNIA\ALTADENA LIBRARY DISTRICT\ALTADENA MAIN LIBRARY\1011602022-ACM.DWG, SHT1



LEGEND:

- 001 — ACM SAMPLE LOCATION
- 000 — POSITIVE ACM SAMPLE LOCATION
- 400 SF. ACM 9"x9" OFF WHITE WITH BROWN SMUDGES VINYL FLOOR TITLE AND ASSOCIATED MASTIC
- 1,000 SF. ACM 9"x9" BEIGE VINYL FLOOR TITLE AND ASSOCIATED MASTIC

NOTE:
4,700 SF ACCM
INTERIOR STUCCO

N

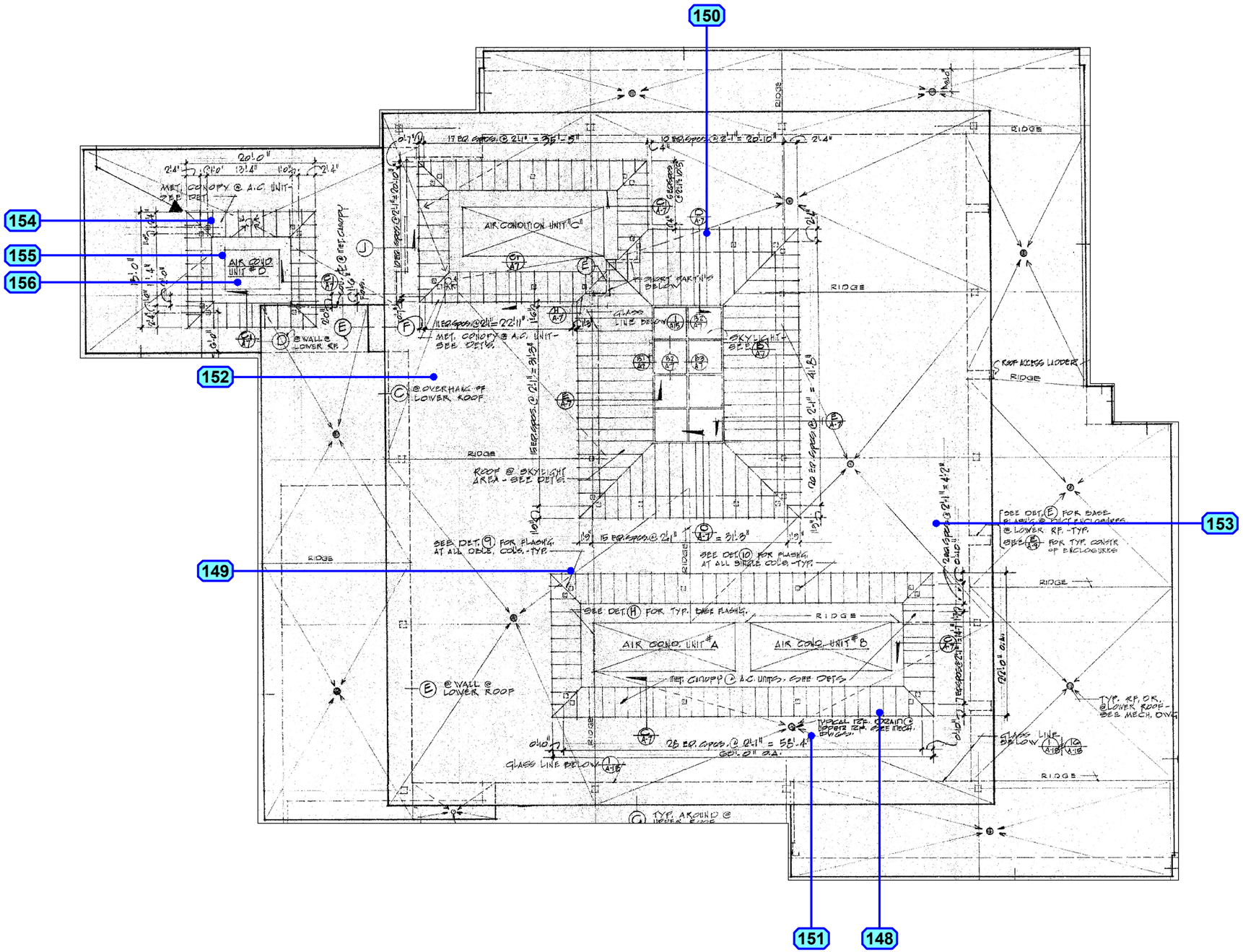
NOT TO SCALE

ASBESTOS SURVEY
MAIN LEVEL FLOOR PLAN

ALTADENA LIBRARY DISTRICT
600 EAST MARIPOSA STREET
ALTADENA, CALIFORNIA 91001

Project Number:	1011602022
Date:	10/13/2021
Drn. By:	AK
Ckd. By:	SD
Scale:	AS SHOWN
Figure:	2

H:\2021\OTHER OFFICES\CALIFORNIA\ALTADENA LIBRARY DISTRICT\ALTADENA MAIN LIBRARY\1011602022-ACM.DWG, SHT2



LEGEND:

001 — ACM SAMPLE LOCATION

000 — POSITIVE ACM SAMPLE LOCATION

N

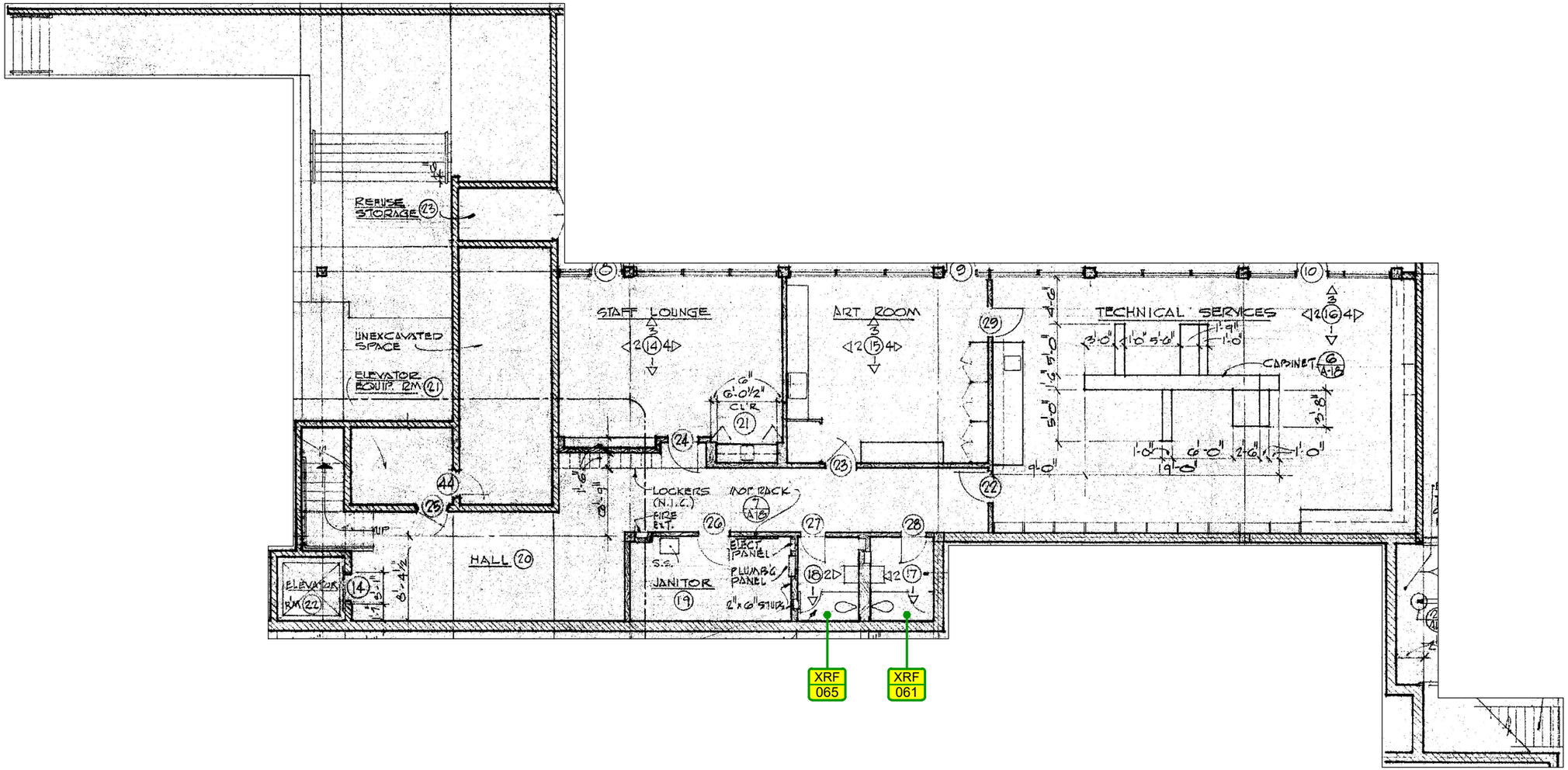
NOT TO SCALE

ASBESTOS SURVEY
ROOF PLAN

ALTADENA LIBRARY DISTRICT
600 EAST MARIPOSA STREET
ALTADENA, CALIFORNIA 91001

Project Number: 1011602022	
Date: 10/12/2021	
Drn. By: AK	Ckd. By: SD
Scale: AS SHOWN	
Figure: 3	

H:\2021\OTHER OFFICES\CALIFORNIA\ALTADENA LIBRARY DISTRICT\ALTADENA MAIN LIBRARY\1011602022-ACM.DWG, SHT3



LEGEND:

- P00 — PAINT BULK LOCATION
- P00 — POSITIVE PAINT BULK LOCATION
- XRF 001 — XRF POSITIVE LOCAITON

N

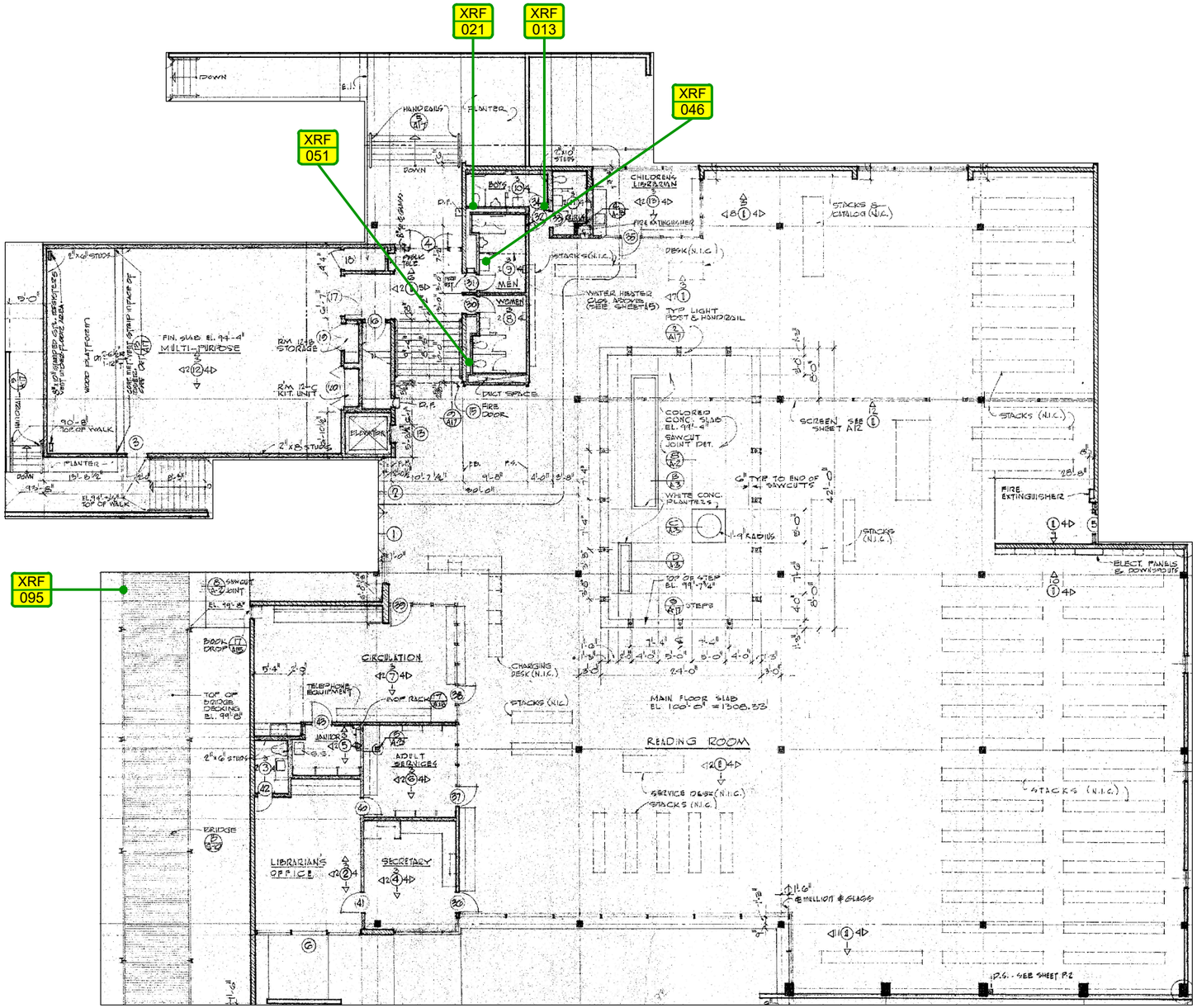
NOT TO SCALE

LEAD SURVEY
LOWER LEVEL FLOOR PLAN

ALTADENA LIBRARY DISTRICT
600 EAST MARIPOSA STREET
ALTADENA, CALIFORNIA 91001

Project Number: 1011602022	
Date: 10/12/2021	
Drn. By: AK	Ckd. By: SD
Scale: AS SHOWN	
Figure: 4	

H:\2021\OTHER OFFICES\CALIFORNIA\ALTADENA LIBRARY DISTRICT\ALTADENA MAIN LIBRARY\1011602022-ACM.DWG, SHT4



LEGEND:

- P00 — PAINT BULK LOCATION
- P00 — POSITIVE PAINT BULK LOCATION
- XRF 001 — XRF POSITIVE LOCAITON

N

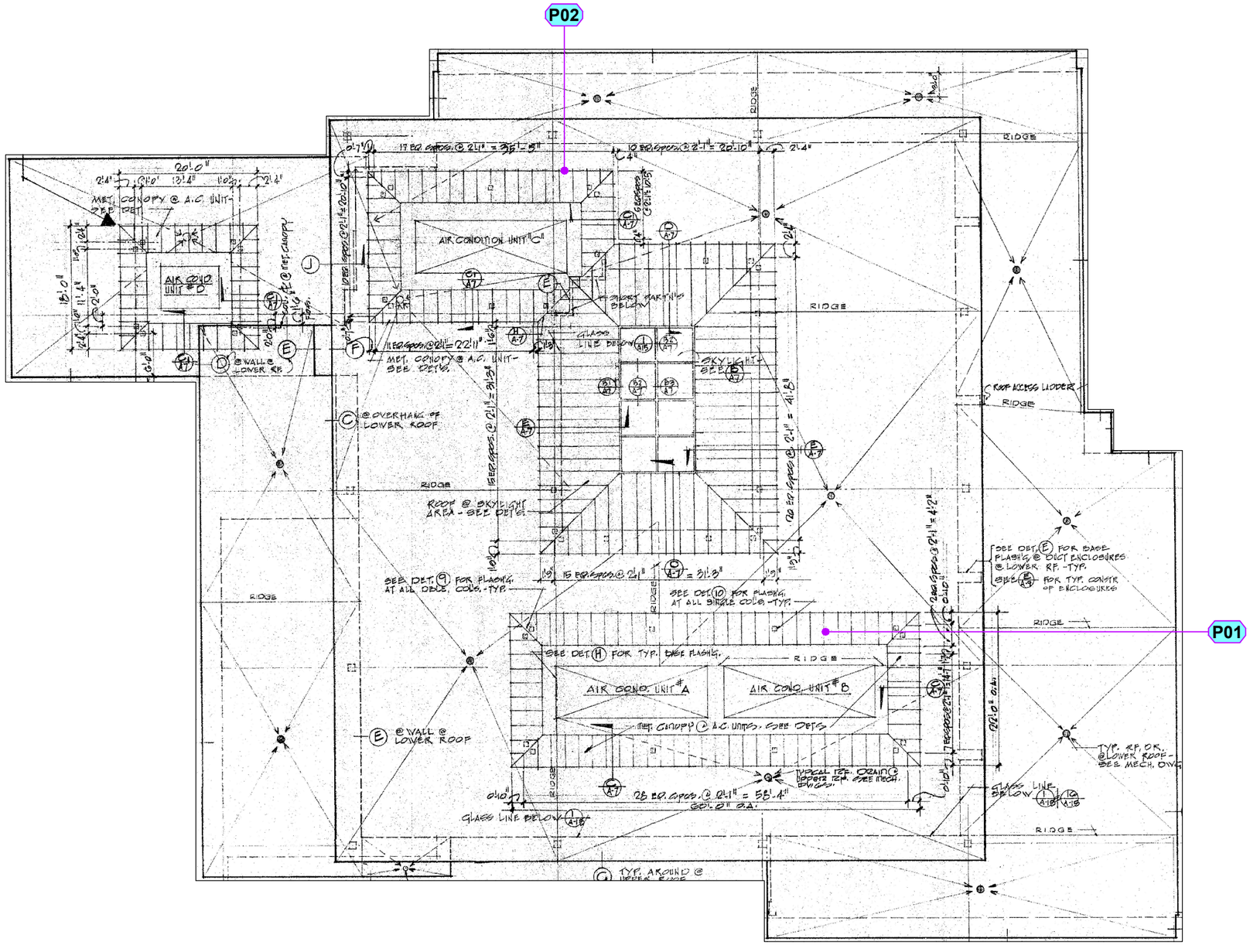
NOT TO SCALE

LEAD SURVEY
MAIN LEVEL FLOOR PLAN

ALTADENA LIBRARY DISTRICT
600 EAST MARIPOSA STREET
ALTADENA, CALIFORNIA 91001

Project Number: 1011602022	
Date: 10/12/2021	
Drn. By: AK	Ckd. By: SD
Scale: AS SHOWN	
Figure: 5	

H:\2021\OTHER OFFICES\CALIFORNIA\ALTADENA LIBRARY DISTRICT\ALTADENA MAIN LIBRARY\1011602022-ACM.DWG, SHT5



LEGEND:

- P00 — PAINT BULK LOCATION
- P00 — POSITIVE PAINT BULK LOCATION
- XRF 001 — XRF POSITIVE LOCAITON

N

NOT TO SCALE

LEAD SURVEY ROOF PLAN

ALTADENA LIBRARY DISTRICT
600 EAST MARIPOSA STREET
ALTADENA, CALIFORNIA 91001

Project Number: 1011602022	
Date: 10/12/2021	
Drn. By: AK	Ckd. By: SD
Scale: AS SHOWN	
Figure: 6	

H:\2021\OTHER OFFICES\CALIFORNIA\ALTADENA LIBRARY DISTRICT\ALTADENA MAIN LIBRARY\1011602022-ACM.DWG, SHT6

LA Testing

520 Mission Street South Pasadena, CA 91030

Tel/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order:	322422744
Customer ID:	32ATCA45
Customer PO:	1011602632
Project ID:	

Attention:	Matthew Reilly	**Phone:**	(323) 517-9780
	Atlas Technical	**Fax:**	(323) 517-9781
	1180 Durfee Avenue, Suite 125	**Received Date:**	10/17/2024 11:25 AM
	South El Monte, CA 91733	**Analysis Date:**	10/17/2024 - 10/18/2024
		Collected Date:	10/17/2024

Project: 1011602632 / 600 East Mariposa Street Altadena, California 90232

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1A *322422744-0001*	Altadena Main Library, Roof, SE Side - Concrete on Roof Deck	Gray/Gold Non-Fibrous Homogeneous		2% Mica 98% Non-fibrous (Other)	None Detected
1B *322422744-0002*	Altadena Main Library, Roof, SE Corner - Concrete on Roof Deck	Gray/Gold Non-Fibrous Homogeneous		2% Mica 98% Non-fibrous (Other)	None Detected
1C *322422744-0003*	Altadena Main Library, Roof, Center - Concrete on Roof Deck	Gray/Gold Non-Fibrous Homogeneous		2% Mica 98% Non-fibrous (Other)	None Detected
1D *322422744-0004*	Altadena Main Library, Roof, SW Side - Concrete on Roof Deck	Gray/Gold Non-Fibrous Homogeneous		2% Mica 98% Non-fibrous (Other)	None Detected
1E *322422744-0005*	Altadena Main Library, Roof, West Side - Concrete on Roof Deck	Gray/Gold Non-Fibrous Homogeneous		5% Mica 95% Non-fibrous (Other)	None Detected

Analyst(s)

Brittany Quiring (1)

James Siepler (4)

Jerry Drapala Ph.D, Laboratory Manager
or Other Approved Signatory

LA Testing maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by LA Testing. LA Testing bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore LA Testing recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by LA Testing South Pasadena, CA NVLAP Lab Code 200232-0, CA ELAP 2283

Report amended: 10/21/2024 12:52:32 Replaces initial report from: 10/18/2024 07:47:21 Reason Code: Client-Change to Project

PART 7: ASBESTOS AND LEAD ABATEMENT SPECIFICATIONS

ASBESTOS REQUIREMENTS
TABLE OF CONTENTS

Table of Contents

SECTION 1. ASBESTOS BIDDING REQUIREMENTS 4
Part 1.1 - Site Investigations 4
Part 1.2 - Insurance Requirements 4
Part 1.3 - Licenses and Qualifications Requirements 5
SECTION 2. ASBESTOS GENERAL REQUIREMENTS - DEFINITIONS 5
SECTION 3. NOTIFICATIONS, SUBMISSIONS, POSTINGS 10
Part 3.1 - Notification 10
Part 3.2 - Pre-Construction Submittals 10
Part 3.3 - Submittals During the Work Process 12
Part 3.4 - On-Site/Clean-Room Area Postings and Documentation 13
Part 3.5 - Job Site Documents 13
Part 3.6 - Project Close-out Documents 14
SECTION 4. SITE SECURITY 14
SECTION 5. EMERGENCY PLANNING 14
SECTION 6. PRE-CONSTRUCTION MEETING 15
SECTION 7. MATERIALS AND EQUIPMENT 15
Part 7.1 - Contractor Equipment and Supplies 15
Part 7.2 - Rental Equipment and Supplies 17
SECTION 8. WORK SITE FACILITIES 17
SECTION 9. RESPIRATORY PROTECTION 17
SECTION 10. PERSONNEL PROTECTION REQUIREMENT AND TRAINING 21
SECTION 11. WORKER DECONTAMINATION ENCLOSURE SYSTEMS 22
SECTION 12. WORKPLACE ENTRY AND EXIT PROCEDURES 23
SECTION 13. DIFFERENTIAL AIR PRESSURE SYSTEMS 23
Part 13.1 - Negative Pressure Requirements 23
Part 13.2 - DOP Testing 24
Part 13.3 - Differential Pressure Recording Requirements 24
Part 13.4 - Differential Pressure System 25
SECTION 14. EXECUTION, WORK SCHEDULE 26
Part 14.1 – Execution 26
Part 14.2 - Power Outage Procedures 29
Part 14.3 - Work Schedule 29

ASBESTOS REQUIREMENTS
TABLE OF CONTENTS

SECTION 15. REMOVAL PROCEDURES 30
SECTION 16. WASTE CONTAINER PASS-OUT PROCEDURES 30
SECTION 17. CLEAN-UP PROCEDURE 31
Part 17.1 - Clean-up Procedure 31
Part 17.2 - Visual Clearance Criteria 32
SECTION 18. CLEARANCE AIR MONITORING 33
SECTION 19. MONITORING 33
SECTION 20. DISPOSAL PROCEDURES 34
Part 20.1 - Disposal Procedures 34
Part 20.2 - Transportation to the Landfill 35
Part 20.3 - Disposal at the Landfill 35
SECTION 21. PATENTS AND PREVAILING WAGES 36
Part 21.1 - Patents 36
Part 21.2 - Prevailing Wage Requirements 36
SECTION 22. PERMITS AND FEES 36
SECTION 23. SPECIFIC PROCEDURES AND REQUIREMENTS 36
Part 23.1 - General Repair of Damaged Thermal System Insulation (TSI) 36
Part 23.2 - Glove Bag Technique Requirements 37
Part 23.3 - Mini-Cube Enclosure Requirements 38
Part 23.4 - Roofing Abatement Requirements General Requirements 39
Part 23.5 - Vinyl Floor Tile (VFT) & Associated Adhesive Abatement Requirements General Requirements 45
Part 23.6 - Carpet Removal over Vinyl Floor Tile (VFT)/Tile Adhesive Requirements General Requirements 49
Part 23.7 - Boiler Unit Removal Requirements 51
Part 23.8 - Sheetrock and Joint Compound Abatement Requirements 52
Part 23.9 - Impact to and Removal of Transite Pipe, Shingle, or Sheeting Materials 55
Part 23.10- Demolition with Selected Asbestos Containing Materials Left in Place 56
Part 23.11 - Contaminated Attic Space Procedures 57
Part 23.12 - Non-Friable, Non-Hazardous, Glazing Abatement Requirements General Requirements 59
Part 23.13 - Subfloor Crawl Space Dirt Removal Requirements General Requirements 61
Part 23.14 - Subfloor Enclosure Requirements 64
Part 23.15 - Subfloor Space Pony Wall Installation, Dirt Removal Requirements General Requirements 65
Part 23.16 - Installation of “Rat Slab” in Sublfoor Crawl Space Requirements General Requirements 68
Part 23.17 - Stucco/Texture Removal and Containment Requirements General Requirements 72

ASBESTOS REQUIREMENTS
TABLE OF CONTENTS

Part 23.18 - Fireproofing Abatement Requirements General Requirements 75

SECTION 24. ASBESTOS SPECIFICATIONS/PROCEDURES 78

Part 24.2 - Removal Locations 78

Part 24.3 - Materials to be Abated 78

Part 24.4 - Containment and Abatement Requirements 79

Part 24.5 - Contractor Assist Requirements 79

Part 24.6 - Worker Protection 80

Part 24.7 - Electrical and Water Hook-Ups 80

Part 24.8 - Visual and Air Clearance Criteria 80

Part 24.9 - Owner's Responsibility 80

Part 24.10 - Disposal Requirements 80

Part 24.11 - Work Periods 81

Part 24.12 - Pre-Construction Submittal List 82

Part 24.13 - Interim Construction Submittals 84

Part 24.14 - Post Construction Submittal List 84

SECTION 25. ASBESTOS RESULTS LIST 85

SECTION 26. FORMS 94

Altadena Library

SECTION 1. ASBESTOS BIDDING REQUIREMENTS

Part 1.1 - Site Investigations

By submitting a bid for asbestos related work, the asbestos abatement contractor acknowledges that they have investigated and satisfied themselves as to:

1. The conditions affecting the work, including but not limited to, physical conditions of the site which may bear upon site access, handling, and storage of tools and materials, access to water, electric, or other utilities, or otherwise affect performance of required activities;

2. The character and quality of all surface and subsurface materials or obstacles to be encountered, in so far as, this information is reasonably ascertainable from an inspection of the site, including exploratory work done by the Owner or a designated consultant, as well as, information presented in drawings and specifications included with this contract. Any failure by the asbestos abatement contractor to acquaint themselves with available information will not relieve them from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner is not responsible for any conclusions or interpretations made by the asbestos abatement contractor on the basis of the information made available by the Owner.

Part 1.2 - Insurance Requirements

The successful asbestos abatement contractor shall purchase and maintain insurance that will protect them from claims that may arise out of or result from the activities under this Contract. Whether those activities are performed by the asbestos abatement contractor, by any Subcontractor, or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

Successful asbestos abatement contractor shall submit proof of coverage, as well as, Subcontractors under the Worker's Compensation insurance system of the State of California or other similar benefit acts.

Successful asbestos abatement contractor shall submit a certificate of general liability insurance protecting against liability for bodily injury and property damage arising from asbestos abatement contractor’s activities under this contract.

Such certificate of insurance must contain the following provisions:

1. The limit of liability shall not be less than $1,000,000.00 per occurrence for bodily injury and property damage liability combined.

2. The Owner, Owner’s Agents, and Consultant must be named as additional insured, but only in respect to liability arising or resulting from activities under this contract.

3. In the event of cancellation of the insurance policy, the Owner shall be given thirty days advance written notice.

4. The insurance certificate must state that the insurance includes liability coverage for asbestos abatement work.

Successful asbestos abatement contractor’s Subcontractors shall submit a certificate of general liability insurance protecting against liability for bodily injury and property damage arising from Contractor's activities under this contract.

Such certificates of insurance must contain the following provisions:

1. The limit of liability shall not be less than $1,000,000.00 per occurrence for bodily injury and property damage liability combined.

2. The Owner, Owner's Agents, and Consultant must be named as an additional insured, but only in respect to liability arising or resulting from activities under this contract.

3. In the event of cancellation of the insurance policy, the Owner shall be given thirty days advance written notice.

Part 1.3 - Licenses and Qualifications Requirements

The asbestos abatement contractor shall be duly licensed in the State of California with the Contractors State License Board (CSLB) in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code, as amended. This includes certification for asbestos-related work, and all other trades or work required under this contract and within these specifications.

The asbestos abatement contractor shall submit a statement, signed by an officer of the company, containing the following information:

1. A record of any citations issued by Federal, State, or Local regulatory agencies within the last 3 years, relating to asbestos abatement activity. Include projects, dates, and resolutions.
2. A list of penalties incurred through non-compliance with asbestos abatement project specifications, including liquidated damages, overruns in scheduled time limitations, and resolutions.
3. Situations in which an asbestos-related contract has been terminated including projects, dates, and reasons for terminations.
4. A list of any asbestos-related legal proceedings/claims in which the Contractor (or employees scheduled to participate in this project) has participated or is currently involved. Include descriptions or role, issue, and resolution to date.

The asbestos abatement contractor is fully and totally responsible at all times for compliance with payment of prevailing wage rates pursuant to provisions of the California Labor Code, for compliance with Division 2, Part 7, Chapter 1, California Labor Code, including but not limited to Section 1776; and for compliance with California Labor Code, Section 1777.5 for all apprentice able occupations.

SECTION 2. ASBESTOS GENERAL REQUIREMENTS - DEFINITIONS

Abatement - Procedures beyond a special operations and maintenance program to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, and repair.

ACGIH - American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Building D-5, Cincinnati, Ohio 45211

AHERA - Asbestos Hazard Emergency Response Act

AIHA - American Industrial Hygiene Association, 475 Wolf Ledges Parkway, Akron, Ohio 44311

Air Filtration Device - See "Pressure Differential Unit"

Airlock - A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least three (3) feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

Air Monitoring - The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure normally utilized for asbestos follows the NIOSH Standard Analytical Method for Asbestos in Air Phase Contrast Microscopy Method 7400. For clearance air monitoring, electron microscopy methods may be utilized for lower detection and specific fiber identification.

Altadena Library

Air Sampling Professional - The professional contracted or employed by the Owner to supervise and/or conduct air monitoring and analysis schemes. This individual may also function as the Asbestos Project Manager, if qualified. Supervision of air sampling and evaluation of results should be performed by a Certified Asbestos Consultant (CAC) and have specialized experience in air sampling for asbestos. Other acceptable Air Sampling Professionals include Environmental Engineers, Architects, Chemists and Environmental Scientists or others with equivalent experience in asbestos air monitoring. This individual shall not be affiliated in any way other than through this contract with the contractor performing the abatement work.

Ambient Air - The air outside the buildings and structures or the air as it normally exists in a space prior to abatement.

Amended Water - Water to which a surfactant has been added.

ANSI - American National Standards Institute, 1430 Broadway, New York, New York, 10018

Asbestos - Means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite grunerite (amosite), anthophyllite, actinolite, and tremolite.

Asbestos Containing Hazardous Waste - Materials defined by the State of California to be packaged, labeled, transported, and disposed of as an asbestos hazardous waste. This includes all friable asbestos-containing material over one-percent (1%) asbestos. This also includes all asbestos-containing material containing less than one-percent asbestos for which one or more bulk samples have not been point counted and found to contain less than one-percent (1%) asbestos.

Asbestos Containing Material (ACM) - Cal/OSHA - Material composed of asbestos of any type and in an amount greater than one percent (1%) either alone or mixed with fibrous or non-fibrous materials.

Asbestos Containing Construction Material (ACM) - a manufactured construction material containing greater than 0.1% asbestos by weight by the PLM method.

Asbestos Containing Waste - Asbestos-containing material or asbestos-contaminated objects requiring disposal.

Asbestos Project Manager (APM) - (Competent Person) - An individual qualified by virtue of experience and education, designated as the Owner's representative and responsible for overseeing the asbestos abatement project.

ASTM - American Society for Testing and Materials, 916 Race Street, Philadelphia, PA 19103.

Authorized Visitor - The Owner (and any designated representative) and any representative of a regulatory or other agency having jurisdiction over the project.

Bidder - A duly licensed and accredited asbestos contractor who was present at the bid-walk and has submitted a bid.

Cal/OSHA - California Division of Occupational Safety and Health.

Certified Industrial Hygienist (CIH) - An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

Clean Room - An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of workers' street clothes and clean protective equipment.

Competent Person - A person who is an accredited EPA Asbestos Contractor/Supervisor and whose accreditation is current.

Containment - Isolation of the work area from the rest of the building to prevent escape of asbestos fibers.

Contract Documents - Written contractual agreements between the Owner and the Contractor that pertain to the work on this project.

Altadena Library

Contractor - The individual and/or legal entity and its subcontractors and employees of the contractor and subcontractor awarded the contract.

Contractor/Supervisor - A person who successfully completed an initial U.S. EPA and/or state-approved five-day AHERA accreditation course and who has maintained that training through approved annual refresher training, and possesses current and valid AHERA accreditation documentation as a AHERA accredited Contractor/Supervisor.

Class I, II, III, or IV Work - Work classes described in 8 CCR 1529 that describe different levels of asbestos work.

Critical Barrier - Critical Barriers used to restrict water and air flow. Critical Barriers are the barriers placed over openings in the walls and ceilings of a work area in order to ensure that airborne fibers cannot escape the work area via these openings. The Contractor will construct impermeable barriers at all exits or openings, including doorways, duct chases, mechanical shafts, elevator shafts, floor openings, drains, and the like, so that all possible exit or entrance routes are effectively barricaded and sealed. Unless otherwise specified in the Contract documents, critical barriers shall be constructed of at least one layer of 6-mil thick poly.

Critical Barrier Negative Pressure Test - Required test for negative pressure with only critical barriers and air filtration units installed. This test must be conducted prior to the installation of cleaning barriers, but may be conducted with or without the decontamination unit in place.

Decontamination Enclosure System - (Also known as Decon or Waste Transfer Decon) A series of connected rooms designed for the decontamination of workers and equipment that is separated from the work area and from each other by z-flapped curtained doorways. This unit shall be constructed with at least six-mil poly for the floors, walls, and ceiling. All decontamination enclosure systems used for worker entry and exit shall be equipped with a shower.

Demolition - The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations.

DOP - Dispersed Oil Particulate, which are normally used as an agent for testing the efficiency of HEPA filters.

Dust or Debris - Any visible dust or debris remaining in an abatement area will be considered asbestos-containing residue.

Encapsulant - A liquid material which can be applied to asbestos-containing material which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

EPA - U.S. Environmental Protection Agency

Equipment Room - A contaminated area or room that is part of the worker decontamination enclosure system with provisions for storage of contaminated clothing and equipment.

Exterior of Containment HEPA Filtered Pressure Differential Unit - An air-purifying unit positioned outside, rather than inside the regulated work area. The face, or filter portion of the unit is integrated within the work area, and the remainder of the unit (housing, wheels, rivets, control panel, etc.) is located outside of the work area. This allows filters on the air intake to be changed from within the regulated area but access to the machine itself is available to those outside the area. Pressure differential units which pass DOP testing across the HEPA filter, but fail at rivets, control panels, wheels, etc. may be used in this fashion as long as the failure point of the unit can remain on the exterior of containment while the face of the unit and filters are inside containment.

Facility - Any institutional, commercial or industrial structure, installation, or building.

Facility component - Any pipe, duct, boiler, tank, reactor, turbine, or furnace at or in a facility or any structural member or a facility.

Fed OSHA or OSHA - Federal Occupational Safety and Health Administration.

Altadena Library

Fixed object - A piece of equipment or furniture in the work area, which cannot be removed from the work area.

Friable asbestos - Asbestos-containing material, which can be crumbled to dust when dry, under hand pressure or by mechanical means.

Glove Bag Technique - A method with limited applications for removing small amounts of friable asbestos-containing materials from ducts, short piping runs, valves, joints, elbows, and other non-planar surfaces. The glove bag is constructed of 6 mil transparent polyethylene with two inward projecting long sleeves, an internal tool pouch, and an attached, labeled receptacle for asbestos waste.

HVAC - Heating, ventilation and air conditioning system.

HEPA Filter - A high efficiency particulate air filter capable of removing particles 0.3 microns in diameter from an air stream with 99.97% efficiency.

HEPA Vacuum - A vacuum system equipped with HEPA filtration.

Lock-down - To mist the air and to wet surfaces with an agent designed to bind asbestos fibers together.

Manometer - Instrument for measuring the static air-pressure differential across a barrier.

Mini-Enclosure - Mini-enclosures shall be constructed of 6 mil polyethylene (attached with tape and/or glue to walls and floors) and shall be small enough for 1-2 workers who can enter the enclosure, complete the abatement exercise, pass out the containerized debris and exit.

Monitoring - May include:

1. Visual inspection for the presence of visible emissions; or
2. Air monitoring performed in accordance with accepted methods;
3. Core samples of encapsulated or bridged materials.
4. Bulk sampling of soil during and following abatement.
5. Sampling substrata following abatement.

Movable Object - An unattached piece of equipment or furniture in the work area, which can be removed from the work area.

NVLAP - National Voluntary Laboratory Accreditation Program.

NESHAP - The National Emissions Standards for Hazardous Air Pollutants (40 CFR Part 61, Nov. 20, 1990)

NIOSH - The National Institute for Occupational Safety and Health CDC-NIOSH, Building J N.E. Room 3007, Atlanta, GA 30033

Outside Air - The air outside buildings and structures.

Owner - The Owner or Owners authorized Representative.

PCM - Phase contrast microscopy according to NIOSH Method 7400.

Plasticize - See "Poly".

Poly - Polyethylene sheeting. Used to cover floors, walls, ceilings, create critical barriers, and seal open vents on mechanical systems, etc. Note: All poly must be flame-retardant.

Pressure Differential Unit (PDU) - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity airflow into contaminated areas from adjacent uncontaminated areas. Air intake must have a filter on it, which can be changed within a containment.

Regulated Area - means an area established by a Contractor to demarcate areas where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit. Additionally “Regulated Area” means any measure used to restrict access to an area where

personnel impacting asbestos-containing materials are required to wear respiratory protection and/or protective clothing by the project specifications regardless of airborne asbestos concentration levels.

Regulations - shall include but not be limited to:

1. U.S. Environmental Protection Agency Regulations for Asbestos (Title 40, Code of Federal Regulations, Part 61, Subparts A & B)

2. U.S. Environmental Protection Agency, Office of Toxic Substances, Asbestos-Containing Materials in School Buildings, A Guidance Document, Parts 1 & 2.

3. Title 8, Chapter 4, Subchapters 1 through 21, California Administrative Code, General Industry Safety orders, Section 5208 "Asbestos" or the applicable sections of the Federal Asbestos Regulations. Cal/OSHA Construction Safety Orders, Section 1529.

4. "Asbestos Hazard Emergency Response Act", U. S. Environmental Protection Agency, 40 CFR, Part 763. Final Rule and Notice.

5. Applicable Local County Air Pollution Control Owners and Air Quality Management Districts.

Removal - The stripping of any asbestos-containing materials from surface or components of a facility.

Renovation - Altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.

Shower Room - A room between the clean room and the equipment room in the decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination. The shower room must be equipped with an overflow pan to contain water splashed, leaked or spilled out of the shower unit.

Staging Area - Either the holding area or some area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.

Structural Member - Any load-supporting member of a facility, such as beams and load-supporting walls or any non-load-supporting member, such as ceilings and non-load supporting walls.

Submittals - Pre, interim, and post job documents submitted by the contractor to Owner/Owner's Representative as indicated in General Requirements and Bidding Requirements.

Surfactant - A chemical agent added to water to improve wetting and penetration into asbestos materials.

TEM - Transmission Electron Microscopy according to AHERA specifications for Level II analysis.

Visible emissions - Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

Waste Load-out/Transfer System - A decontamination system utilized for transferring containerized waste from inside to outside of the work area. A series of three connected rooms used for the load-out of asbestos-containing materials that have been properly containerized. The waste load out chamber system shall normally consist of three connected chambers adjacent to the work area. Each chamber shall be constructed with six- mil thick poly for the floors, walls, and ceiling

Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other utensils, which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

Altadena Library

Work Area - Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area is a work area, which has been sealed, plasticized, and equipped with a decontamination enclosure system. A non-contained work area is an isolated or controlled-access work area which has not been plasticized nor equipped with a decontamination enclosure system.

Worker - Contractor employee who has completed course work and passed the exam for an EPA accredited, AHERA asbestos abatement worker. Certificate must be current.

SECTION 3. NOTIFICATIONS, SUBMISSIONS, POSTINGS

Part 3.1 - Notification

Prior to commencement of work the Contractor shall send notices of work to be completed to the agencies listed below with a copy of each to be provided to the Owner or its representative at the pre-construction meeting.

For compliance with 40 CFR part 61.146 of Subpart M, send notice at least 10 working days prior to start of work to the following appropriate agencies if trigger quantities of are met or for a demolition:

- South Coast Air Quality Management District (SCAQMD)
  Address: 21865 Copley Drive - Diamond Bar, California 91765
  Phone Number: (909) 396-2336

- U.S. EPA - Region IX Southern California Field Office
  Address: 600 Wilshire Blvd. Suite 940 Los Angeles, CA 90017
  Phone Number: (213) 244-1800

For compliance with Title 8, California Administrative Code, Construction Safety Order 1529, Asbestos Regulations send written notice at least one day prior to start of work to: Department of Occupational Safety and Health (Cal/OSHA)

These notices shall include, at a minimum:

1. The name and address of the Contractor,
2. The name and address of the work site,
3. The type of work to be done including the percent asbestos content of the material, the methods used to prevent migration of the fibers, personal protective measures, the number of workers involved, any union representation of the workers and the methods of disposal including the names and EPA numbers of both the certified hauler and the waste disposal site.
4. The start and finish dates and changes in start and completion dates shall be reported immediately to the proper agency. Use forms provided by agency whenever possible.

Part 3.2 - Pre-Construction Submittals

Submit copies of documents required to be included in the Bidding Requirements. At a minimum, these documents will include:

1. Copy of State of California Contractor License Issued by CSLB
2. Copy of State of California CSLB Active License
3. Copy of State of California CSLB Asbestos Certification
4. Copy of Department of Industrial Relations; Division of Occupational Safety and Health; Certificate of Registration for Asbestos-related Work
5. Copy of signed statement from company officer listing citations and pending proceedings against the Contractor, or if there have been no citations, a copy of the statement that no actions by regulatory agencies have occurred in the last three years signed by an officer of the company.

Altadena Library

Submit copies of insurance certificates, which meet requirements as, outlined in Section 1, Part 1.2, of this Specification.

Submit copies of notifications to government agencies.

Submit proof satisfactory to the Owner that required permits have been acquired applicable to the project being performed and specific to the project site and location. If no city, county, or other permits for parking, waste container location, or variances for scheduled work hours are required this should be stated in writing and submitted to the Owner.

Submit Sub-contractors information or statement that Sub-contractors will not be required or used during this project. This statement should also include that if it becomes necessary to use a Sub-contractor during this project that Sub-contractor will not be allowed to perform work until all required documentation has been submitted for review by the Owner or Owner's agent/site representative, and the Contractor receives written approval for use of the Sub-contractor on this project.

Submit a complete list of all rented equipment, or equipment expected to be rented from an outside contractor for use in "Regulated Areas", "Work Areas", or "Containments", where the equipment may be exposed to elevated levels of airborne asbestos. If no equipment is to be rented a statement should be submitted stating no equipment will be used on the project. The statement should also include that if it becomes necessary to use rented equipment that written statements from each rental company will be provided to the Owner prior to its use, indicating the rental companies acknowledgment that the equipment is provided for and may be used in areas where airborne levels of asbestos may be present.

Submit non-emergency telephone numbers, other then 911, for the appropriate Police, Sheriff, and Fire Departments. This list of numbers shall also include the Name, pager or cell phone numbers of the on-site supervisor and his immediate company supervisor.

Submit detailed written directions from the project site to the medical facility to be used in case of an emergency. Also include a map which sufficiently shows the route to be taken from the site to the designated medical facility.

Submit written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

Submit detailed information on preparation of work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. List decontamination procedures for personnel, work area and equipment, abatement methods and procedures, required air monitoring program, procedures for handling and disposing of waste materials and procedures for final decontamination and cleanup.

Submit a detailed work schedule. The schedule shall have, as a minimum, the work area and the day/month for beginning and terminating work in each work area. During progress of work, it shall be the Contractor's responsibility to keep the schedule current and up to date.

Submit documentation satisfactory to the Owner that the Contractor's employees, including foremen, supervisor, and any other company personnel or agents who may be exposed to airborne asbestos fibers or who may be responsible for any aspects of abatement activities, have received required US EPA AHERA training.

Submit documentation from physician that all employees or agents who may be exposed to airborne asbestos in excess of background levels have been provided with an opportunity to be medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. In addition, document that personnel have received medical monitoring as required by Cal/OSHA regulations. The Contractor must be aware of and provide information to the examining physician about unusual conditions in the workplace environment (e.g., high temperatures, humidity, chemical

contaminants) that may impact the employee's ability to perform work activities.

Submit documentation of respirator fit testing for all Contractor employees and agents who must enter any work area where asbestos-containing materials may or will be impacted. This fit testing shall be in accordance with qualitative procedures as required by OSHA regulations or be quantitative in nature. Documentation pertaining to NIOSH approvals for all respiratory protective devices utilized on site shall also be included.

Submit copy of waste transporters Department of Toxic Substances Control, Hazardous Waste Transporter Registration if hazardous asbestos-containing waste is to be removed during the project. If hazardous asbestos-containing waste will not be generated, submit the name, address, and registration information for the waste hauler to be used for transporting the waste.

Submit documentation listing the name and site address of the waste facility designated to receive asbestos-containing waste generated during this project. This documentation shall also include the EPA Identification number, and a copy of the current permit authorizing the waste facility to accept and dispose of asbestos-containing waste.

Submit Safety data sheets (SDS) for any and all applicable, materials, supplies, etc. These documents must be legible and completely reveal information required to be communicated to the Contractor’s employees, visitors, and Owner Representatives.

Submit manufacturers' certifications that high efficiency particulate air (HEPA) vacuums, pressure differential units and other local exhaust ventilation equipment conform to ANSI Z9.2-79.

Submit name of laboratory/person to be used for Phase Contrast Microscopy (PCM) analysis and copy of current NVLAP Certificate of Accreditation (if applicable), and most recent NIOSH Proficiency Analytical Testing Program results.

Submit a written statement that OSHA monitoring will be performed for all asbestos-related activities performed during this project. This statement must be on company letterhead, dated, include name of the site or project being worked on, and signed by an authorized agent of the company performing the asbestos-related work.

Submit manufactures documentation pertaining to the capability of wastewater filters to filter particles of 1.0 micron in size.

Part 3.3 - Submittals During the Work Process

Submit weekly - copies of work site entry/exit logs as well as information on worker and visitor access.

Submit weekly - copies of results of air sampling data collected during the course of the abatement including OSHA compliance air monitoring results.

Submit weekly - copies of air-differential manometer graphs and HEPA filter change logs. (see Section 13)

Submit weekly - copies of all transport manifests, trip tickets, weights and disposal receipts as applicable for all asbestos waste materials removed from the site during the abatement process.

Submit as applicable - copies of current insurance certificates, notifications, worker documentation, etc. if these items expire during the course of the project.

During abatement, the Owner will upon request submit to the Contractor results of bulk material analyses and air sampling data collected during the course of the abatement. These serve only to monitor Contractor performance during the project.

Submit upon request during or after completion of the project, documentation deemed by the Owner to be pertinent to the project.

Altadena Library

Part 3.4 - On-Site/Clean-Room Area Postings and Documentation

The following items shall be posted at the entrance to “Regulated Areas”, “Work Areas”, and “Containments”, or in the possession of the Contractor’s on-site supervisor where respiratory protection or protective clothing is required by this Specification.

A Cal/OSHA Information poster and a Cal/OSHA Construction Site poster.

A copy of the CAL-OSHA and the local AQMD/APCD or EPA NESHAP Notification (if applicable).

Non-emergency telephone numbers, other then 911, for the appropriate Police, Sheriff, and Fire Departments. This list of numbers shall also include the Name, pager or cell phone numbers of the on-site supervisor and his immediate company supervisor. Detailed written directions from the project site to the medical facility to be used in case of an emergency. Also a map, which sufficiently shows the route to be taken from the site to the designated medical facility.

Written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

Written entry/exit procedures shall be posted in the clean room and equipment room. (See Section 12)

List of persons authorized to be in restricted area. The list shall include, among others, the following names with addresses and phone numbers:

1. Contractor
2. Testing Laboratory
3. Air-sampling Professional
4. Owner's representatives
5. Asbestos Project Manager
6. Any other designated by the Owner

Entry/exit log for work performed in all “Regulated Areas”, “Work Areas”, and “Containments” where respiratory protection or protective clothing is required by this Specification. Contractor shall maintain copies of all entry/exit logs on the site during the performance of asbestos-related work.

All of the Contractor's personnel and area air sampling results shall be posted in the clean room area or in the possession of the Contractor’s site supervisor if no decontamination unit is required for the work being performed within 72 hours of collection, and submitted to Owner’s agent/site representative weekly unless otherwise noted.

Copies of Safety data sheets (SDS) for all materials on-site.

Part 3.5 - Job Site Documents

The following shall be in the possession of the Contractor’s supervisor at each job site:

1. All contract specifications to include change orders, etc. Contractor competent person must sign a document stating he has full knowledge of all Sections included in this specification.
2. Written Injury and Illness Prevention Program.
3. Written Respiratory Protection Program
4. An updated list of all contractor employees who have worked on this job.
5. List of all US EPA AHERA competent employees (supervisors).
6. Training records
7. Medical records
8. Respiratory fit test records

Part 3.6 - Project Close-out Documents

Contractor shall submit post-construction submittals to Owner/Owner's Representative within thirty (30) days of the completion of asbestos-related work. This documentation shall include at a minimum any and all applicable documents as outlined in Part 3.2 and Part 3.3 of this Section. In addition the Contractor should consult and submit as applicable documents identified in Section 24, Part 24.3 - Post Construction Submittal List

SECTION 4. SITE SECURITY

The work area is to be restricted to authorized, trained and protected personnel. A list of authorized personnel shall be established prior to job start and posted in the clean room of the work decontamination facility, or in the possession of the on-site supervisor for the Contractor.

Contractor shall report to the Owner immediately entry into the work area by unauthorized individuals.

A logbook shall be maintained during the project. Anyone who enters the work areas must record name, affiliation, time in, and time out for each entry.

Access to all "Regulated Areas", "Work Areas", and "Containments" shall be through a designated entry point.

All other means of access (doors, windows, hallways, etc.) shall be blocked or locked to prevent entry to or exit from these areas. The only exceptions for this rule are the waste pass out air-lock, and emergency exits in case of fire or accident.

Emergency exits shall NOT be locked; however, they shall be sealed with polyethylene sheeting and tape until needed. All emergency exits shall be clearly designated. They shall also have a razor knife permanently in place to facilitate emergency exit.

Contractor should have control of site security during abatement operations whenever possible, in order to protect work efforts and equipment. During off-hours, access to the abatement area shall be restricted by a lockable entry.

Contractor will have Owner's assistance in the enforcement of restricted access by Owner's employees.

Storage of debris will be such that access to it is limited to the Contractor. Lockable bins shall be utilized and they shall be locked at all times except when loading occurs. No soft covers will be allowed for any storage containers. When a container with rolling tops is being used, all access points to the interior of the container must be secured by the Contractor with locks of sufficient strength to require special effort to gain access to the interior of the waste container.

SECTION 5. EMERGENCY PLANNING

Emergency planning and procedures shall be developed by the Contractor and shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, trips and falls, and heat related injury and agreed to by Contractor and Owner prior to abatement initiation. These emergency procedures shall be established and presented to all employees and the Owner prior to the beginning of any work. A written emergency plan shall be posted or in the possession of the on-site supervisor for the Contractor regardless of the work being performed.

A copy of the Contractor's written Injury and Illness Prevention Program shall be posted or in the possession of the on-site supervisor for the Contractor regardless of the work being performed.

Employees shall be trained in evacuation procedures in the event of workplace emergencies. Telephone numbers of all emergency response personnel shall either be in the possession of the on-site supervisor, or

be prominently posted in the clean change area and equipment room, along with the locations of the nearest telephone indicated on a map or diagram.

At least two fire extinguishers shall be present on site and in close proximity to the work being performed regardless of the type of work being conducted. At least one fire extinguisher shall be present outside of any containment. Additional extinguishers shall be distributed according to Cal/OSHA requirements or as identified in this Specification.

When open abatement is being performed, an emergency blast horn (canned air horn) shall be placed inside of containment for emergency evacuation in the event of a fire or other emergency.

If noted in any other section of this Specification, a means of radio communication shall be established between inside and outside of containment whenever a decontamination setup is required, particularly for all open abatement projects. This requirement may be met through walkie-talkies or by wired communication systems.

During hot working conditions, such as in an attic space during summer, or in containments where live steam or hot water lines are exposed, special attention must be given to the possibility of heat stress and burns. The Owner's site representative may make recommendations for work breaks for employees, but the supervisor is ultimately responsible for his workers.

SECTION 6. PRE-CONSTRUCTION MEETING

A pre-construction meeting will be held at a time and location to be determined by the Owner. The successful Bidder, his on-site supervisory personnel, and Air Sampling Professional (if applicable), representatives of the Owner, Owner's Representative, and other individuals as necessary shall be present at this meeting.

Prior to this meeting, the Contractor shall provide all required submittals, as indicated above in Section 3, Part 3.2. The Contractor should use the Pre-Construction Submittal List provided in Section 24, Part 24.1 to assure all required submittals are included in his submittal package.

SECTION 7. MATERIALS AND EQUIPMENT

Part 7.1 - Contractor Equipment and Supplies

Deliver all consumable materials in the original packages, containers or bundles bearing the name of the manufacturer and brand name (where applicable). These must be approved by the Owner. Polyethylene (Poly) sheeting, of appropriate thicknesses for walls, floors, and ceilings, (4 mil's thick for walls, 10 mil's thick for lining of waste containers, 6 mil's thick for floors and all other uses), shall be provided in widths selected to minimize the frequency of joints.

All poly shall be flame-retardant regardless of its designated use inside or outside any building.

Poly sheeting utilized for worker decontamination enclosure shall be opaque white or black in color and each layer shall be a minimum of 6 mil thick. At least two layers shall be required. Modesty barriers are to be erected whenever and wherever the Owner's agent/site representative determines one is needed.

Disposal bags shall be constructed of 6 mil poly with labels required by OSHA, CDPH, Toxic Substance Control regulations. Disposal drums shall be metal or fiber board with locking ring tops to be used only if required and/or allowed by selected waste facility.

Stick-on labels as per CDPH and OSHA requirements for disposal drums shall be provided. Warning signs as required by OSHA shall be provided and posted per regulations.

Surfactant (wetting agent) shall be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or

equivalent, mixed in a proportion of one (1) fluid ounce to five (5) gallons of water or as specified by manufacturer. If amosite asbestos in present in the materials being removed, the Contractor shall use a surfactant that is designed to wet amosite. This information shall be submitted to the Owner's agent/site representative before the start of the project.

A sufficient quantity of pressure differential units equipped with HEPA filtration and operated in accordance with ANSI Z9.2-79 and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, Appendix F: Recommended Specifications and Operating Procedures for the Use of Negative Pressure Systems for Asbestos Abatement, shall be utilized so as to meet the requirements of Section 12. All HEPA filtration equipment must be tested with DOP or an equivalent testing agent (see Section 12).

An adequate number of respirators for the work force shall be on hand. These respirators will include, when specified:

1. Type "C" air-supplied respirators in positive pressure or pressure demand mode with full face pieces and HEPA-filtered disconnects.

2. Powered-air respirators with HEPA-filters, full face piece.

3. Half mask or full face respirators with HEPA filters.

All respirators shall be NIOSH-approved and be equipped with supplies for immediate replacement of defective parts.

Full body disposable protective clothing, including head, body, and foot coverings consisting of material impenetrable by asbestos fibers (Tyvek or equivalent) shall be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.

Additional safety equipment (e.g., hard hats, eye protection, safety shoes, disposable PVC gloves), as necessary shall be provided to all workers and authorized visitors.

Non-skid footwear shall be provided to all abatement workers.

If launderable clothing is to be worn underneath disposable protective clothing, it shall be provided by the Contractor to all abatement workers. Laundering must occur in accordance with applicable OSHA requirements.

A sufficient supply of scaffolds, ladders, lifts and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided as needed.

Rubber dustpans and rubber squeegees shall be provided for cleanup. A sufficient supply of HEPA-filtered vacuum systems shall be available.
The Owner's agent/site representative may require the use of additional equipment if he feels the number or amount of certain items or materials is not sufficient.

Vacuums and pressure differential units shall arrive on site sealed and free of debris. Pre-filters of all pressure differential units must be new and unused.

No product or material will be used on the project unless the product data sheets and all SDS's have been submitted, reviewed, and approved by the Owner for use. Any product or material found on the project which has a product data sheet and/or SDS available and has not been approved will be removed from the site by the Contractor until review and approval has been completed by the Owner.

Part 7.2 - Rental Equipment and Supplies

Any equipment rented and delivered to the site for the purpose of conducts asbestos abatement work must be accompanied with documentation verifying that the rental agency has been notified, and acknowledges receipt of notification that the equipment being rented will be used for asbestos abatement work. This documentation must be submitted to the Owner's agent/site representative prior to the equipment being delivered to the job site. Rental equipment, including scaffolding, will be held to the same standard of cleanliness as all other equipment on this project.

All rented equipment must be inspected and accepted by Owner's agent/site representative as it arrives onsite. Any equipment covered with dust (no matter the source of dust), plaster debris, multiple layers of encapsulant and/or spray glue, or any other debris will not be accepted. Delays caused by a lack of clean equipment will not extend Contractor's schedule. Equipment rejected due to a lack of cleanliness must be removed from Owner's grounds in order to be cleaned. Dirty equipment wrapped in plastic will not be acceptable.

The Owners' agent/site representative must be informed 24 hours prior to the delivery of any rental equipment. The decision of the Owner or its representative on all rental equipment and supplies shall be final.

SECTION 8. WORK SITE FACILITIES

- The Owner shall provide sanitary facilities for abatement personnel outside of the enclosed work area. To use these facilities all workers shall wear normal street clothes, not bathing suits or Tyveks.
- The Owner shall provide water for construction purposes. Contractor shall connect to existing Owner system. The Owner or its representative shall specify the wastewater discharge location and location of waste containers.
- The Owner shall provide the electrical source.
- The Owner shall specify on-site parking areas, if available, and access to the site.

SECTION 9. RESPIRATORY PROTECTION

All respiratory protection shall be provided to workers in accordance with the submitted written respiratory protection program, which includes all items as required by OSHA. This program shall be posted in the clean room of the worker decontamination enclosure system or adjacent to the clean room.

The Contractor shall ensure that all workers entering the regulated area wear appropriate respiratory protection. Respiratory protection provided workers shall be in accordance with 8 CCR 1529, and 8 CCR 5144 and the respiratory protection program submitted by the Contractor. This program shall be available at the project site.

The Owner or their representative may deny access to a regulated area to anyone who, in the final judgement of the Owner or their representative, is not properly wearing adequate respiratory protection for the project conditions. This includes but is not limited to those wearing unidentified respirators, those with improperly sealed respirators, those wearing respirators in an improper manner such as over their protective suit hood, or in any other fashion judged by the Owner or their representative to be improper or inadequate to protect the individual from the airborne asbestos at the project site.

The Contractor shall provide each worker needing respiratory protection with his or her own, individually identified, NIOSH-approved respirator. At a minimum, these respirators will be equipped with a P-100 series HEPA filter. The Contractor shall provide additional filter types if that becomes necessary for specific hazards discovered on the job site or if required in the contract documents.

The Contractor shall ensure that all workers use the respirator in compliance with the manufacturer's instructions for proper use and care of that product.

Workers must perform positive and negative respirator seal checks each time a respirator is put on, provided the respirator design so permits.

The Contractor shall ensure that those workers wearing powered air purifying respirators test the air flow rate according to the frequency and methods specified by the manufacturer.

Workers shall be given, at least, a qualitative fit test in accordance with procedures detailed in the Cal/OSHA requirements for all respirators to be used on this abatement project. An appropriately administered quantitative fit test may be substituted for the qualitative fit test.

The Contractor shall ensure and provide written records to the Owner's agent/site representative that all workers wearing tight-fitting respirators have been appropriately fit tested in accordance with the requirements of 8 CCR 5144.

The Contractor shall ensure that nothing interferes with the seal of the respirator to the face of the worker. This includes but is not limited to facial hair, clothing, protective clothing, equipment or anything else that comes between the respirator and the face of the worker.

Use of any respirator must comply with the manufacturer's instructions for proper use and care of that product.

The Contractor shall ensure that workers wear respirators underneath protective clothing.

Workers conducts any work that may create an airborne release of asbestos must wear appropriate respiratory protection. This includes, but is not limited to the pre-cleaning of asbestos contamination of furniture, equipment and floors, and the set-up of contaminated work areas.

The judgement of the Owner's agent/site representative shall be final if there is a disagreement between the Owner and the Contractor regarding the need for wearing or the type of personal protection required.

In no event will a negative exposure assessment be allowed to lower respiratory protection, from that listed in the Scope of Work or required by regulation in the absence of an NEA, prior to the start of a project. Air samples used for negative exposure assessments created after the project has started must be from work conducted under this contract.

Minimum Respiratory Protection for OSHA Class I Work

Unless specified differently in the contract documents, the Contractor's employees conducts Class I work will wear tight-fitting, full-face powered-air purifying respirators for all Class I work that will take more than one hour to complete. They must wear a minimum of a half-face negative air–purifying respirator for Class I work lasting less than one hour. Contract documents may require additional respiratory protection, such as the use of supplied air respirator systems if, in the opinion of the Owner's agent/site representative, the airborne asbestos levels are expected to exceed one fiber per cubic centimeter of air (1 f/cc)as an 8 hour TWA.

After work has begun, if the Contractor wishes to lower respiratory protection requirements, such as for glove bag or other work, he or she must demonstrate to the Owner's agent/site representative that personal air sampling results from that project prove that airborne fibers levels are below the Cal/OSHA Permissible Exposure Limit. The Owner's agent/site representative will normally require sampling results used for this purpose to include several days of sampling taken during the work expected to generate the highest airborne levels. The Owner's agent/site representative will have final authority regarding whether or not the respiratory protection may be reduced below the need for powered-air purifying respirators.

Altadena Library

Unless stated otherwise in the contract documents, for the purposes of respiratory protection, Class I work will include the removal of materials such as gypsum board surfaces that are covered with a texturing or skim coat material that contains over one percent asbestos.

Minimum Respiratory Protection for Class II and III Work Practices

Unless specified differently in the contract documents, the Contractor's employees conducts Class II or III work will wear a minimum of half-face, air-purifying respirators. Contract documents may require additional respiratory protection, such as the use of full-face air-purifying respirators or powered-air-purifying respirators.

After work has begun, if a Contractor wishes to lower respiratory protection requirements, he or she must demonstrate to the Owner's agent/site representative that personal air sampling results from that project prove that airborne fibers levels are below the limit of quantification for the phase contrast microscopy method. The Owner's agent/site representative will normally require sampling results used for this purpose to include several days of sampling taken during the work expected to generate the highest expected airborne levels. The Owner's agent/site representative will have final authority regarding whether or not the respiratory protection may be reduced or eliminated. For example, the Owner's agent/site representative may require personal samples be analyzed by TEM before determining that asbestos does not pose an airborne health risk.

Respiratory Protection for All Work Classes and Unclassified Work

Respiratory protection will always be required if thermal system or surfacing materials are disturbed or if any asbestos-containing materials will not be removed substantially intact.

The Owner's agent/site representative has full authority to raise the level of respiratory protection required for access to the regulated area if in his or her judgement additional respiratory protection is required. For example, if personal air sample results collected by either the Contractor or Owner's agent/site representative indicate higher than expected levels, the Owner's agent/site representative is authorized to increase the level of required respiratory protection. The Owner's agent/site representative will determine if the increased respiratory protection is due to new, unexpected developments such as the discovery of new materials, or if the increase is due to the Contractor failing to follow good work practices. The judgement on this matter by the Owner's agent/site representative will be final.

The Owner is not responsible for increased costs or delays resulting from the need to increase respiratory protection should the reason for the increased respiratory protection be due to the Contractor's failure to adequately utilize wet work methods and/or the prompt cleanup of debris.

The Contractor may only implement respiratory protection changes after receiving written approval for the change from the Owner's agent/site representative.

Waste transport and disposal personnel must wear at least half-face, air-purifying respirators when handling intact sealed bags. Powered-air purifying respirators must be worn if waste containers spill, break, or in any other fashion require a Class I work cleanup be performed.

The Contractor shall comply with the respiratory protection requirements listed in 8 CCR 1529 until that date that 8 CCR 5144 includes assigned protection factors for all respirators. The following list of respirators and their assigned "protection factors" shall be the criteria for the selection of respiratory protection.

Respirator Selection	Protection Factor
Half-face or full-face air purifying respirator equipped with HEPA filter.	10
Full-face air purifying respirator equipped with HEPA filter with quantitative fit test.	50
Full-face Type C continuous flow supplied air.	1000

Altadena Library

Full-face, powered air purifying respirator equipped with HEPA filter.	1000
Full-face supplied air respirator operated in pressure demand mode.	1000
Full-face supplied air respirator operated in pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus.	1000

Workers shall be provided, as a minimum, with personally issued and marked respirators equipped with HEPA filters approved by NIOSH to be worn in the designated work area and/or whenever a potential exposure to asbestos exists. Owner or its representative may refuse entry to the work area to a worker with an unidentified respirator.

Sufficient filters shall be provided for replacement as required by the workers or applicable regulations. Disposable respirators shall not be used.

No worker shall be exposed to levels greater than 0.01 f/cc as determined by the protection factor of the respirator worn and the work area fiber levels.

Whenever type C respirator protection is used, compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer specifications. The compressed air system shall have a reservoir of adequate capacity to allow the escape of all respirator wearers from contaminated areas in the event of compressor failure. Compressors must meet the requirements of 29 CFR 1910.134(d).

Location of compressors must be approved by Owner for exhaust and noise considerations.

Compressors must have an in-line carbon monoxide monitor and periodic inspection of carbon monoxide monitors must be documented. Documentation of adequacy of compressed air systems/respiratory protection systems must be retained on site. This documentation will include a list of compatible components with the maximum number and type of respirators that may be used with the system. Periodic testing of compressed air shall insure that systems provide air of sufficient quality (Grade D breathing air). Documentation of this testing, including a description of the process used to perform the test and results of each test must be submitted to the Owner’s agent/site representative weekly.

Location of compressors must be approved by Owner for exhaust and noise considerations.

Whenever powered air-purifying respirator protection is used, a sufficient supply of replacement batteries and HEPA filter cartridges shall be provided to the workers. At least one spare fully charged battery must be available on-site for each PAPR in use. The flow rate delivered to the face piece shall be checked and recorded by the Contractor on the sheet provided by the Owner’s agent/site representative each time a worker dons the respirator. Written respiratory protection program must detail how this testing is to be performed by each employee or the onsite supervisor. The Contractor shall ensure that the flow rate for PAPRs meets the requirements listed in 8 CCR 1544 regarding tight and loose fitting respirators as appropriate. The Contractors shall also ensure that PAPRs are worn, checked and maintained according to the directions of the manufacturer.

During encapsulation operations or usage of other organic base aerosols (e.g. spray glue, expanding foam, etc.) workers shall be provided with combination organic vapor/HEPA filter respirator cartridges.

The Contractor shall comply with OSHA CFR 1926.110(h) (Respiratory Protection) and Cal/OSHA Title 8 5144. The following list of respirators and their associated "protection factors" shall be the criteria for the selection of respiratory protection.

Sufficient filters shall be provided for replacement as required by the workers or applicable regulations. Disposable respirators shall not be used.

No worker shall be exposed to levels greater than 0.01 f/cc as determined by the protection factor of the respirator worn and the work area fiber levels.

Whenever powered-air-purifying respirator protection is used, a sufficient supply of replacement batteries and P-100 HEPA filter cartridges shall be provided to the workers. At least one spare fully charged battery must be available on-site for each PAPR in use. The flow rate delivered to the face piece shall be checked and recorded by the Contractor on the sheet provided by the Owner's agent/site representative each time a worker dons the respirator. Written respiratory protection program must detail how this testing is to be performed, and whether it will be performed by each employee or the onsite supervisor.

During encapsulation operations or usage of other organic base aerosols (e.g. spray glue, expanding foam, etc.) workers shall be provided with combination organic vapor/HEPA filter respirator cartridges.

During application of spray-poly, appropriate NIOSH approved respirators shall be worn.

SECTION 10. PERSONNEL PROTECTION REQUIREMENT AND TRAINING

Prior to commencement of abatement activities all personnel who will be required to enter the work area or handle containerized asbestos containing materials must have received adequate training in accordance with the OSHA, EPA AHERA and NESHAP regulations.

Special on-site training on equipment and procedures unique to this job site shall be performed by the Contractor as required by law or recommended by the equipment manufacturer.

The Contractor shall provide training in emergency response and evacuation procedures. See Section 8 for respiratory protection requirements.

Disposable clothing, including head, foot and full body protection, shall be provided in sufficient quantities and adequate sizes for all workers and authorized visitors. Damaged coveralls shall be immediately repaired or replaced.

Hard hats, protective eyewear, proper protective gloves, rubber boots and/or other footwear shall be provided by the Contractor as required for workers and authorized visitors. Safety shoes may be required for some activities.

Contractor personnel shall not wear street clothes or clothes of any type underneath the protective disposable clothing. Upon exiting the work area, no items worn in the work area, such as clothing, personal protective gear, footwear, or hair coverings will be allowed to be worn past the shower of the decontamination unit.

Contractor worker(s) have the option of wearing disposable undergarments underneath protective clothing, or they may be nude underneath the protective disposable clothing.

Each time the worker(s) enter the work area they will don new disposable clothing and undergarments. Street clothes (including underwear and shoes) shall not be allowed inside the work area, except during visual clearance activities.

The Owner's agent/site representative may use personal judgement to allow authorized personal to wear street clothes under protective clothing during the construction of final visual or other short-duration visits into the regulated area during times which asbestos is not being disturbed and gross debris is not present. In these situations, approved by the Owner's agent/site representative, the authorized person shall deposit the protective clothing on the dirty side of the decontamination system and may proceed through the shower and clean room wearing the clothes they wore under their protective clothing.

SECTION 11. WORKER DECONTAMINATION ENCLOSURE SYSTEMS

Worker decontamination enclosure systems shall be provided at all locations where workers will enter or exit the work area. One system at a single location for each contained work area is preferred. Enclosure systems may be constructed out of metal, wood or plastic support as appropriate. Plans for construction, including materials and layout, shall be submitted as shop drawings and approved, in writing, by the Owner or its representative prior to work initiation. Detailed descriptions of portable, prefabricated units, if used, must be submitted for the Owner's approval. The worker decontamination enclosure system shall consist of at least a clean room, a shower room, and an equipment room, separated from the work area by air lock. The air lock shall be, at least, three feet square. All fabricated units shall have, at least, two layers of 6 mil poly sheeting.

All decontamination units and pressure differential units outside the building shall be covered with a 2"x 4" wood studs and ½" plywood enclosure for security. Pressure differential units shall be secured as necessary to the building or ground. Exhaust openings shall have metal grates to prevent objects from being put into the exhaust openings. Pressure differential exhaust shall be exhausted to an area acceptable to the Owner or Owner’s agent/site representative.

Entry and exit from all air locks and decontamination enclosure system chambers shall be through doorways designed to restrict air movement between chambers when not in use. The dirty side shall have an extra layer of 6 mil poly sheeting on the floor as a "boat layer" and it shall be replaced at least daily.

The clean room shall be sized and equipped to adequately accommodate the work crew. Lighting, heat and electricity shall be provided as necessary for comfort. This space shall not be used for storage of tools, equipment or materials (except as specifically designated), or as office space.

Shower room shall contain one or more showers as necessary to adequately accommodate workers. The shower enclosure shall be constructed to ensure against leakage of any kind. In addition, the shower shall be a separate unit from the decontamination unit walls. The shower unit cannot be made from poly. Metal or hard plastic is acceptable. An adequate supply of soap, shampoo and towels shall be supplied by the Contractor and available at all times. Shower water shall be drained, collected and filtered through a system with at least 5.0 micron particle size collection capability.

The shower pan in the shower chamber shall be, at least, 3' x 3' in size. The shower chamber shall be constructed so that no water from the shower can spray out of the chamber, nor any water run down the sides of the poly and miss the pan. The shower chamber dimensions shall be determined by the size of the shower pan but are not to be smaller than 3' wide by 3' long by 6' tall. At least one shower shall be provided for each 10 workers. A minimum of two showers will be required for more than 10 workers.

Each decontamination chamber shall have, at least, a 4" lip of poly from the floor up the wall to prevent possible transfer of water and debris between chambers. Excess poly at the corners of this floor is to be fitted to the sides of the chamber by folding poly and taping, as opposed to cutting away excess poly and taping seams. In addition to this 4" lip of poly the shower chamber shall have an overflow pan, in which the shower unit sits, that is capable of holding 2" of water. The filter system and any hose connections transferring contaminated water shall be located in a secondary containment, such as a metal pan. Any leakage shall be double-bagged or re-filtered.

Unless otherwise specified in the scope of work, the minimum size of the decontamination chambers shall be the following:

Clean Room	5' x 6'
Shower	3' x 3'
Dirty Room	5' x 6'
Air Locks	3' x 6' (If five chambers are specified)

Abatement work will be stopped if decontamination unit is not kept in acceptable condition.

Storage or consumption of food and/or beverages shall not be permitted inside the containment or within any of the decontamination chambers. Food or drink consumption within containment will result in the abatement worker(s) dismissal from the site for the duration of the project.

SECTION 12. WORKPLACE ENTRY AND EXIT PROCEDURES

All workers and authorized personnel shall enter the work area through the worker decontamination enclosure system.

All personnel who enter the work area must sign the entry log, located in the clean room. This log shall have space for the workers name, social security number, time in, time out, and be identified with the project name, date, and containment location.

All personnel, before entering the work area, shall read and be familiar with all posted regulations, personal protection requirements (including workplace entry and exit procedures) and emergency procedures. A sign-off sheet shall be used to acknowledge that these have been reviewed and understood by all personnel prior to entry.

All personnel shall proceed first to the clean room (or area), remove all street clothes and don appropriate respiratory protection and disposable coveralls, head covering and foot covering. Hard hats, eye protection and gloves shall also be worn, as appropriate. Clean respirators and protective clothing shall be provided and utilized by each person for each separate entry into the work area.

Personnel wearing designated personal protective equipment shall proceed from the clean room through the shower room and equipment room to the main work area.

Before leaving the work area all personnel shall remove gross contamination from the outside of respirators and protective clothing by brushing and/or wet-wiping procedures. (Small HEPA vacuums with brush attachments may be utilized for this purpose.) Each person shall clean bottoms of protective footwear in the walk-off pan just prior to entering the equipment room.

Personnel shall proceed to equipment room where they remove all protective equipment except respirators. Deposit disposable clothing into appropriately labeled containers for disposal.

Reusable, contaminated footwear shall be stored in the equipment room when not in use in the work area. This footwear shall be cleaned prior to being removed from the work area. Placing footwear in two 6 mil poly bags is sufficient for moving from one containment to another, but not for moving from one site to another.

Still wearing respirators, personnel shall proceed to the shower area, clean the outside of the respirators and the exposed face area under running water prior to removal of respirator, then shower and shampoo to remove residual asbestos contamination. Various types of respirators will require slight modification of these procedures.

After showering and drying off, proceed to the clean room and don clean disposable clothing if there will be later re-entry into the work area, or street clothes if it is the end of the work shift.

These procedures shall be posted in the clean room and equipment room.

SECTION 13. DIFFERENTIAL AIR PRESSURE SYSTEMS

Part 13.1 - Negative Pressure Requirements

Negative pressure shall be maintained at 0.025" water differential at all times during abatement activities, including entry/exit and bag out procedures. Contractor shall assign crewmembers to determine cause of loss

of pressure any time containment's negative pressure drops below 0.025" water differential. All work will be stopped in any containment for which the negative pressure drops below 0.025" water differential, until problem is resolved and pressure returns to 0.025" water differential or better.

In the event that containment cannot be brought up to 0.025" water differential, abatement contractor must increase number of negative pressure differential units until 10 air changes per hour is taking place. If this fails to raise negative pressure to acceptable levels, Contractor may request in writing a reduction in negative pressure requirements. If Owner's agent/site representative agrees that Contractor has tried all possible remedies, Owner's agent/site representative may grant reduction in negative pressure requirement. Owner's agent/site representative is under no obligation to grant this request.

All negative pressure units installed, but not operating, must be sealed at both the exhaust location and the intake of the machine. This will prevent back draft, which could allow asbestos fiber contamination from the HEPA filter.

Part 13.2 - DOP Testing

Contractor shall provide differential air pressure systems for each work area in accordance with Appendix J of EPA "Guidance for Controlling Asbestos-Containing Materials in Buildings," EPA 560/5-85-024.

All HEPA filtered systems used on this project shall be tested and certified by an independent company, approved in advance by Owner's agent/site representative, on-site and prior to use. All vacuums and pressure differential units shall meet ANSI Z9.2, using an appropriate testing agent. Documentation of these tests shall be provided to the Owner's agent/site representative prior to the use of any HEPA system.

DOP, or equivalent, testing must be conducted on-site, unless stated otherwise in the Scope of Work. All HEPA filtered units, including but not limited to, vacuums, air pressure differential units, and make-up air filters must be tested onsite. Testing of air pressure differential units must include testing of the wheel attachments, control panel, and seam and rivets of the housing, as well as the HEPA filter itself. A unit which passes DOP testing across the filter, but which fails testing for any component of the housing may be certified as an "Exterior of Containment HEPA Filtered Unit" only.

All HEPA equipped equipment to be used on the project must be delivered to the site empty of all debris, clean and free of dust, and in full operating condition. Covering dirty units with poly, other than the HEPA filter surface, will not be acceptable.

DOP or equivalent testing must be conducted by an independent testing company approved in advance by Owner's agent/site representative Contractors may not test their own equipment.

DOP or equivalent testing is required when any HEPA filters are changed.

All HEPA filtered machines, including but not limited to vacuums and negative pressure differential machines, shall be utilized in the manner in which they were DOP tested.

Any negative pressure unit turned upside down, or on its side, must be returned to an upright position and re-DOP tested. Negative pressure units shall not be used on this project while laid on their side or upside down.

In case of a power outage, Contractor must seal exhaust ducts against back draft into containment.

All negative air units will have the filter sealed with poly and tape before being shutdown to prevent back drafting.

Part 13.3 - Differential Pressure Recording Requirements

Differential air pressure shall be continuously monitored by Contractor using a recording instrument, Dwyer Instrument Co., "Photohelic Gauge" or equivalent, connected to an appropriate circular chart recorder or a

comparable recorder that maintains a record of dates, times and pressure differentials. The location of the pressure measurement tap shall be approved in advance by the Owner's agent/site representative. During the operation of the unit, circular charts shall be collected on a daily basis, dated, and signed by an OSHA Competent Person present on site. Pressure differential shall be checked a minimum of every hour during the work shift by a person familiar with the operation of the pressure-differential-filtration units, as well as the recording device. Each check shall be documented with a time and date notation on the circular chart and

"Manometer Readings" form along with the initials of the person performing the check. A copy of the circular chart record shall be submitted to the Owner's agent/site representative on a daily basis. The circular chart shall record time, date, pressure differential, coordinates, and location.

In the event the manometer recording mechanism fails, the Contractor shall be responsible for manually recording the pressure differential at fifteen (15) minute intervals. The log shall be kept until the recording device is operational. The log shall be provided to the Owner's agent/site representative on a daily basis.

The "Manometer Readings" form shall be a record of dates and times of pressure readings and instrument stability.

Connect recording instrument to an audible alarm which will activate at pressure differential of-0.025 inches water gauge air pressure. Defective or non-operating instrumentation may require temporary stoppage of work until instrumentation is replaced.

For larger projects, at least one manometer station shall be in place for each 25,000 square feet of containment space.

Part 13.4 - Differential Pressure System

Selection of pressure differential unit (PDU) air exhaust locations and avenues shall require careful consideration with regard to the work being performed and needs of the owner. Unless there is no viable alternative all air exhaust from PDU's shall be directed out of the building. This is expected to be accomplished through use of a temporary duct system (flexible or rigid) provided by the Contractor, or permanent, dedicated exhaust duct systems present within the building. The first choice should always be to direct PDU air exhaust out of the building through Contractor supplied ducts. The first alternative would be to use an existing dedicated exhaust duct system located within the building. The second alternative would be to direct exhaust air into an above ceiling space with no applied fireproofing, loose insulations or un- jacketed fiberglass insulation on building systems. The third and most undesirable alternative would be to allow exhaust from pressure differential air systems to remain within the buildings occupied spaces. The three alternatives may only be utilized with approval of the owner.

When directing exhaust to a building's exterior through the use of temporary supplied duct, the Contractor shall select a path of travel (if applicable) for these ducts which does not impede building occupants or other trades, result in creation of a hazard to building occupants, or restrict the closing of entry and exit doors to the building. The exhaust opening must not be within 10' of any air intake vents, open windows or open doors, and must not be directed at paths of travel into or out of the building.

When utilizing a dedicated exhaust duct system present within the building the system must be investigated to determine its capability of handling the volume of exhaust air expected to be produced by the pressure differential system. Sufficient air volume of the existing dedicated exhaust duct system should have a minimum of 5X but preferably up to about 10X the total volume capacity of the exhaust of the pressure differential air system. For example, if a single 2,000 cfm PDU is to be used, the dedicated exhaust fan system which will exhaust the air produced by the PDU should be capable of handling about 10,000 cfm of total exhaust air capacity. Use of permanent dedicated exhaust duct systems may also require sealing of adjacent registers in the same exhaust system to allow the PDU exhaust to make up the difference in exhaust volume.

The owner shall provide approval prior to the contractor utilizing any permanent dedicated exhaust systems, which might be considered, since the dedicated exhaust systems will be required to operate at all times the pressure differential air system is operable, and sealing any adjacent registers may not be acceptable. It is critical to note that a dedicated exhaust system is not the same as a return air duct system, which re-circulates air from a given building space back to the HVAC fan unit and ultimately is supplied back to the workspace. Return air duct systems will not be allowed for exhaust from PDU's.

Directing PDU air exhaust into an attic or above ceiling space may only be utilized in specific conditions and is limited to attic spaces with only exposed wood, metal or concrete undersides of roof or flooring systems. The space may not under any circumstances have any existing known or assumed asbestos containing materials present regardless of their condition. The attic or above ceiling space may also not contain any applied fireproofing, loose insulations or un-jacketed fiberglass insulation materials which could be dislodged from the force generated by any exhaust air.

Regardless of the exhaust system utilized, the system and its components shall be inspected daily by the Contractor to ensure compliance with the requirements of this specification, remains in good repair and is otherwise not compromised in any way which could negate its designed purpose. Any deficiencies found in the system being used shall be repaired immediately and if necessary all work will cease until those repairs can be accomplished.

The work area shall have a differential air pressure of -0.030 inches water whenever the work is being performed including removal, gross clean-up, encapsulation of surfaces, bag-out operations and worker entry and exit procedures. If pressure differential ever drops below 0.025 inches water differential, all work, other than cleanup of waste on the floor of containment, must be halted until reason for pressure differential drop has been determined and corrected.

Only unused pre-manufactured, reinforced flexible ducts shall be used within the containment area for exhausting of filtered air. Contractor may not construct ducts using poly or other materials.

All interior of containment PDU's and flexible ducts must be wrapped in poly during all abatement activities. This poly wrap is to be removed after "finish detail" work has been completed, but prior to clearance visual.

Flexible ducts must be supported by solid surface at point of exit from containment. This may require Contractor to install plywood, or similar, structure for exhaust point.

SECTION 14. EXECUTION, WORK SCHEDULE

Part 14.1 – Execution

Contractor and Owner's agent/site representative shall investigate the work area and agree (in writing, if necessary) on the pre-abatement condition of the work area.

Contractor shall post danger signs meeting the OSHA specifications at locations and approaches to locations where airborne concentrations of asbestos may exceed ambient background levels.

When electrical supply within area of abatement poses a hazard, Contractor, in conjunction with the Owner, shall shut down and lock out electric power to all work areas. Contractor shall provide temporary power and lighting sources, ensure safe installation (including ground faulting) of temporary power sources and equipment by complying with all applicable electrical code requirements and OSHA requirements for temporary electrical systems. Contractor shall have a licensed electrician shut down and lock out electric power, and setup temporary power and lighting sources. All cost of electricity shall be paid for by the Owner unless specified differently in the Scope of Work. Cost for set-up of temporary power is the responsibility of the abatement contractor unless specified differently in the Scope of Work.

Altadena Library

When plumbing is required to be altered or becomes damaged, Contractor shall have a licensed plumber disconnect and cap all water as necessary within the work area. Water shall be provided by the Owner from a location near the work area, but not necessarily within the work area.

Shut down and lock out all heating, ventilating and air-conditioning-system (HVAC) components that are in, supply, or pass through the work area. Seal all intake and exhaust vents in the work area with tape and 6-mil polyethylene within the work area (interior) and on the exterior of the building. Also, seal any seams in system components that pass through the work area.

Pre-clean all fixed objects in all work areas using HEPA-filtered vacuums and/or wet-cleaning techniques as appropriate and deemed necessary by the Owner's agent/site representative. Careful attention must be paid to machinery behind grills or gratings where access may be difficult but contamination significant. After pre-cleaning, enclose fixed objects in 6-mil polyethylene sheeting and seal securely in place with tape.

Pre-clean all surfaces in all work areas using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Do not disturb asbestos-containing materials during the pre-cleaning phase.

Unless otherwise stated in the Scope of Work or by agreement with the Owner's agent/site representative Project Manager all non-asbestos-containing materials left in the work area shall be covered by two layers of 6-mil polyethylene sheeting. If any non-asbestos containing materials become contaminated with asbestos during removal, activities these materials shall be disposed of as asbestos-containing materials by the Contractor. The Owner's agent/site representative shall determine the friability of these materials prior to disposal. These materials shall be manifested appropriately.

Contractor shall seal all windows, doorways, elevator openings, corridor entrances, drains, ducts, grills, grates, diffusers, skylights and other openings between the work area and uncontaminated areas outside of the work area. These openings must be sealed with 6-mil polyethylene sheeting and tape. These protective layers shall be in addition to the two polyethylene layers on floors, ceilings and walls. These openings are referred to as critical barriers. Seal all cracks in critical barrier areas with tape, caulk, or foam prior to sealing critical barriers.

A critical barrier only, negative pressure check shall be required prior to the set-up of interior containment. Prior to the Contractor covering critical barriers with additional layers of wall, floor, or ceiling poly, the installation and integrity of critical barrier seals must be approved by the Owner's agent/site representative. Wall, floor and ceiling poly installed prior to the critical barrier negative pressure check shall be removed by the Contractor if deemed required by the Owner's agent/site representative in order to properly test critical barriers.

All items attached to asbestos-containing materials and items which cannot be removed without disturbing asbestos-containing materials shall be removed by the Contractor after establishment of containment and negative pressure. If these items are to be "saved and returned" or "reused" by the Owner, the Contractor must remove and clean them without damage. These items must be cataloged using the attached "Return Item Inventory Sheet" provided by Owner's agent/site representative

Contractor shall cover floors in the work area with polyethylene sheeting. Floor shall be covered with a minimum of two layers of 6-mil polyethylene sheeting. Plastic shall be sized to minimize seams. A distance of at least six (6) feet between seams is sufficient. DO NOT locate any seams at wall/floor joints. Floor sheeting shall extend at least twelve inches (12") up the sidewalls of the work area. Sheeting shall be installed in a fashion so as to prevent slippage between successive layers of material. A layer of 10-mil polyethylene sheeting and/or plywood may be required by the Owner's agent/site representative to protect certain flooring materials -- carpets, hardwood floors, tiles, etc. At no time will wall or ceiling materials be permitted to be dropped onto unprotected floors. This includes areas where the floor surfaces contain asbestos.

Contractor shall cover walls in the work area with polyethylene sheeting. Walls shall be covered with a minimum of two layers of 4-mil polyethylene sheeting. Plastic shall be sized to minimize seams. Seams shall be staggered and separated by a distance of at least six feet (6'). DO NOT locate any seams at wall/floor

joints. Wall sheeting shall overlap floor sheeting by at least twelve inches (12") beyond the wall/floor joint to provide a better seal against water damage and for pressure differential maintenance. Wall sheeting shall be secured adequately to prevent it from falling away from the walls. This may require additional support/attachment when pressure differential systems are utilized.

Contractor shall cover ceilings in the work area with polyethylene sheeting. Ceilings shall be covered with a minimum of two layers of 4 mil polyethylene sheeting. Plastic shall be sized to minimize seams. Seams shall be staggered and separated by a distance of at least six feet (6'). DO NOT locate seams at wall/ceiling joints. Ceiling sheeting shall overlap wall sheeting by at least twelve inches (12") beyond the ceiling/wall joint to provide a better seal against water damage and for pressure differential maintenance. Ceiling sheeting shall be secured adequately to prevent it from falling away from the walls. This may require additional support/attachment when pressure differential systems are utilized.

The Contractor shall add clear sight windows in the containment walls at least 1' x 2' in size. The Owner's agent/site representative will approve quantity and placement of these inspection windows. Owner's agent/site representative has the right to require more clear sight windows or require placement of windows to be altered.

The equipment room shall be used for storage of equipment and tools at the end of a shift after they have been decontaminated using a HEPA-filtered vacuum and/or wet-cleaning techniques as appropriate. A walk-off pan shall be located in the work area just outside the equipment room. A six-mil. disposal bag or a drum lined with a labeled 6-mil polyethylene bag for collection of disposable clothing shall be located in this room.

Contractor shall obtain written containment visual clearance from Owner's agent/site representative prior to the start of abatement in any and all containments.

Contractor is not responsible for normal tape damage due to tape requirements for containment set-up, unless specifically mentioned in the Scope of Work. Contractor is responsible for excessive tape damage and damage from spray glue application, staples, nails, hooks, etc. installed to support containment.

Install and initiate operation of pressure differential equipment as needed to maintain differential-air pressure of -0.030 inches of water. There shall be a sufficient number of differential air pressure units to maintain a minimum of four air changer per hour. All pressure differential units shall have pre-filters at the intake of the system which must be changeable from inside the containment area. Openings made in the enclosure system to accommodate these units shall be made airtight with tape and/or caulking as needed. They shall NOT be exhausted into occupied areas of the building. Twelve inch (12") extension ducts shall be used to reach from the work area to the outside when required. Careful installation, air monitoring and daily inspections shall be done to ensure that the ducts does not release fibers into uncontaminated building areas.

All flexible ducts, protected by poly during abatement or not, pre-filters and intermediate filters shall be manifested and discarded as friable, hazardous asbestos-containing materials. A flexible tube may be used for multiple containments on the same job as long as it is moved from one containment to another in two 6 mil poly bags.

Once the containment has been constructed and reinforced as necessary with pressure differential units in operation as required, the Contractor shall test the enclosure for leakage utilizing smoke tubes. The containment shall be repaired or reconstructed as needed.

All HEPA systems used on this project shall be tested and certified onsite by an independent company prior to use. (See section 12)

Contractor shall submit logs documenting filter changes for each pressure differential unit. Contractor shall clearly identify and maintain emergency and fire exits from the work area. Work shall not begin each day until:

1. Enclosure systems, or modifications thereof, have been designed and built by the Contractor and each step approved by the APM. If design of containment is to be altered in any way, after it is approved by

the Owner's agent/site representative, a written explanation of how and why the containment is to be altered must be submitted to the Owner's agent/site representative for approval.
2. Pressure-differential systems are functioning according to an acceptable design.
3. All pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to the Owner or its representative.
4. All equipment for abatement, clean-up and disposal is on hand.
5. All worker training (and AHERA certification) is completed and documented.
6. The Contractor has installed all required clear transparent view ports made of plastic or equivalent, in the polyethylene wall so that activities can be visually monitored by the Owner's agent/site representative from outside the containment. This window shall measure approximately 1' wide by 2' high. It shall be installed at a location approved by the Owner's agent/site representative. It is recognized that viewing ports are not possible in all locations.
7. All pressure-differential units and vacuums have received and passed onsite DOP testing.
8. Contractor has at least one competent person at each site in which work is taking place.
9. All necessary documents and information have been posted or are on the work site. See Section 2.

Part 14.2 - Power Outage Procedures

The following procedures shall be followed in the event of a power outage (no matter the source of the outage):

1. Immediately stop abatement activities.
2. Wet all debris and/or friable materials within the containment.
3. Depart containment area as soon as reasonable. Shower out or use Hudson sprayers to decontaminate worker if shower is inoperable due to power outage.
4. Seal containment area including:

    A. Decontamination units
    B. Makeup air ports
    C. Bag out chambers
    D. Negative pressure air exhausts or inlets (must be sealed in a fashion that will allow for exhaust of air to occur when power is restored)
    E. Re-establish APD before starting abatement

5. Contractors will be given credit against liquidated damages for all actual down time plus two hours for shut down procedures, decontamination procedures and start up, (total of 6 hours) unless power outage is attributable to abatement contractor actions.

If a generator is required in the specifications, made necessary due to extended power outages, or chosen to be used by the abatement contractor the following issues must be addressed:

1. Generator must not violate any local noise ordinances nor disturb adjacent building occupants.
2. Generator exhaust must not be allowed to contaminate the makeup air being pulled into the containment. It must, also, not be allowed to mix with HVAC air supplied to adjacent occupied buildings.

Part 14.3 - Work Schedule

Contractor shall schedule work as required to meet the needs of the project. During progress of work, it shall be the Contractor's responsibility to inform the Owner's agent/site representative 48 hours or earlier of any and all work shifts to be performed. If at least 48 hours notice is not given, the proposed work shift may be canceled by the Owner's agent/site representative.

Contractor shall be responsible for informing the Owner's agent/site representative in writing at least 48 hours or earlier prior to the proposed addition of any off hours work, work expected to include more than one shift per day, or extend beyond 10 hours in a shift. If 48 hours notice is not given, work shift may be canceled by

the Owner's agent/site representative. The Owner's agent/site representative reserves the right to deny any changes in the work schedule.

If the Contractor wishes to work on a Federal or State holiday, more than five days a week, or more than 9 hours a day, Contractor becomes responsible for cost of project management fees to cover extended hours.

If Contractor fails to appear on-site without notifying Owner's agent/site representative at least 24 hours in advance of a scheduled work shift, the Contractor becomes responsible for all Owner's agent/site representative travel fees, on-site time fees, and other associated project management fees for that day.

At no time shall a work shift extend beyond 12 hours in a day.

SECTION 15. REMOVAL PROCEDURES

Wet all asbestos-containing material with an amended water solution using equipment capable of providing a fine spray mist, in order to reduce airborne-fiber concentrations when the material is disturbed. Saturate the material to the substrate; however, do not allow excessive water to accumulate in the work area. Keep all removed material wet enough to prevent fiber release until it can be containerized for disposal. Maintain high humidity in the work area by misting or spraying to assist in fiber settling and reduce airborne concentrations. Wetting procedures are not equally effective on all types of asbestos-containing materials but shall none-the-less be used in all cases.

Saturated asbestos-containing material (ACM) shall be removed in manageable sections. Removed material should be containerized immediately. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up. Gross debris shall be cleaned up and bagged prior to end of each shift.

Material removed from building structures or components shall not be dropped or thrown to the floor. Material should be removed as intact sections or components whenever possible and carefully lowered to the floor.

Containers (6 mil poly bags or drums) shall be sealed when full. Double bagging of waste material is necessary. Bags shall not be overfilled. They should be securely sealed to prevent accidental opening and leakage by tying tops of bags in an overhand knot or by taping in gooseneck fashion. Do not seal bags with wire or cord.

Asbestos-containing waste with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) will tear the polyethylene bags and sheeting and shall be placed into drums or burlap bags and then poly bags (at least 6 mil's thick) for disposal.

After completion of all stripping work, surfaces from which asbestos-containing materials have been removed shall be wet-brushed and sponged or cleaned by some equivalent method to remove all visible residue.

After the work area has been rendered free of visible residues (and verified clean by the APM), a thin coat of a satisfactory encapsulating agent shall be applied to lock-down non-visible fibers on all surfaces in the work area including structural members, building components and plastic sheeting on walls, floors and covering non-removable items, to seal in non-visible residue.

SECTION 16. WASTE CONTAINER PASS-OUT PROCEDURES

Asbestos-contaminated waste that has been containerized shall be transported out of the work area through the waste transfer airlock or through an approved pass-out arrangement.

Waste pass-out procedures shall utilize two teams of workers, an "inside" team and an "outside" team. The inside team, wearing appropriate protective clothing and respirators for inside the work area, shall clean the outside, including bottoms, of properly labeled containers (bags, drums, or wrapped components) using

HEPA vacuums and wet-wiping techniques and transport them into the waste container pass-out airlock. Provisions for spray cleaning exterior of bags, equipment, and removable items shall be present in the waste pass-out. Waste water from this operation shall be collected and filtered as required through a 1.0 micron filter. No worker from the inside team shall further exit the work area through this airlock.

The three-chamber system is utilized in the following manner. Workers inside the work area place the waste in the initial waste container, which is usually a bag. They then rinse the bag and seal it. They hand it to a worker in the dirty chamber room who inspects the bag and, if it is clean, places it in the secondary waste container. The secondary container is either another bag or a lined rigid-wall container such as a barrel or box. The worker then seals the secondary container and may attach the proper labeling. The worker places the container in the middle chamber. The worker in the clean chamber then reaches in and lifts the container into the clean chamber. The worker inspects it and if not already labeled, attaches the proper labels. The worker then passes the container to the outside worker who transports the container either to the waste transport vehicle or to a holding area. At no time shall z-flaps of transfer system chambers be taped, held or otherwise blocked open. The Contractor must not allow more than one poly airlock doorway to be open at any one time. This prevents a tunnel system and a breakdown in the isolation of the work area. Negative pressure must be maintained during all waste load-out activities.

The contract documents or the Owner's agent/site representative may in allow a one or two chamber system to be used for some projects, as long as the liability to the client, in the judgment of the Owner's agent/site representative is not increased. As with a three-chamber system, in a one or two chamber system, the Contractor may never allow more than one poly air flap doorway to be open at any one time. For example, a one chamber system would function in the following manner. Workers in the work area rinse and seal the initial waste container. They hand the initial container to a worker in the load-out chamber. That worker verifies that the container is clean and then places it into the secondary container which will be either another bag or lined ridged-wall container depending on the specifications. The load-out worker then seals the container and applies the appropriate labels. The sealed, labeled container is then passed to the outside workers who transport it to the waste transport container or holding area.

The exit from this airlock shall be secured to prevent unauthorized entry.

SECTION 17. CLEAN-UP PROCEDURE

Part 17.1 - Clean-up Procedure

Remove and containerize all visible accumulations of asbestos-containing material and asbestos-contaminated debris utilizing rubber dust pans and rubber squeegees to move material around. DO NOT use metal shovels to pick up or move accumulated waste. Special care shall be taken to minimize damage to floor sheeting.

Wet-clean all surfaces in the work area using rags, mops and sponges as appropriate. (Note: Some HEPA vacuums might not be wet-dry vacuums.) To pick up excess water and gross wet debris, a wet-dry shop vacuum with HEPA filter may be used.

Airless sprayers and water hoses shall not be used in a "power washing" fashion on any surfaces.

Contractor shall remove each cleaned layer of polyethylene sheeting from walls and floors. Windows, doors, HVAC system vents and all other critical barriers shall remain sealed. The pressure differential units shall remain in continuous operation. Decontamination enclosure systems shall remain in place and be utilized.

Remove all containerized waste from the work area.

Decontaminate all tools and equipment and remove at the appropriate time in the cleaning sequence.

Contractor shall clean work area and conduct pre-clearance visual. Once pre-visual has been passed by Contractor, Contractor shall allow dust to settle within containment for 24 hours, then return and re-clean by

HEPA-vacuuming and/or wet-cleaning all objects and surfaces in the work area again. At this point Owner's agent/site representative will conduct the final visual. If final visual fails, Contractor must re-clean area until final visual passes. Once final visual is passed, Contractor will be instructed to encapsulate the containment area, unless encapsulation of containment has been disallowed in the Scope of Work or material specific specification.

Contractor may request a reduction in the 24-hour waiting period; if personal samples collected during the abatement, work and detail clean-up work have shown fiber levels below the PEL. Reduction of waiting period must be made in writing, accompanied by personal sample results from this project. Contractor must acknowledge that reduction in waiting period may result in failed clearance air samples and that retaking and re-analyzing these air samples will be at the Contractor's expense. Reduction in waiting time will be at the discretion of the Owner's agent/site representative and client.

Part 17.2 - Visual Clearance Criteria

The Contractor shall perform a pre-final visual of the removal area and adjacent surfaces prior to requesting that the Owner's representative conduct a final visual inspection. The pre-final visual performed by the Contractor shall verify that all materials have been completely removed from the work area, and that the work area meets the requirements specified in Section 17.

In addition, the level of cleanliness in all work areas where asbestos has been removed shall meet the final clearance criteria established in the ASTM E1368-90 Standard Practice for Visual Inspection of Asbestos Abatement Projects.

Upon completion of the pre-final visual inspection by the Contractor a final visual of the containment area will be performed by the Owner's representative. The Owner's agent/site representative will determine the clearance criteria for the project. At a minimum, no three dimensional debris shall be left within the work area; all poly shall be wet wiped so that no visible dust or debris is left; the decontamination chambers shall be clean of all debris; the waste transfer area shall be clean of all debris; all equipment and supplies shall be clean of all debris. The Contractor shall not be released to encapsulate the containment until receiving written acceptance by the Owner's representative stating the removal area and the containment have met the criteria of the Owner's representative for completeness of removal and cleanliness of the containment barriers and surfaces.

The Owner's agent/site representative will conduct the final visual inspection of the work area for visible residue. If any accumulation of residue is observed, it will be assumed to be asbestos and the 24 hour settling period/cleaning cycle will be repeated.

Additional cleaning cycles shall be provided by the Contractor, as necessary, at no cost to the Owner until the specified clean criteria have been met.

Owner's agent/site representative has final say on whether or not an area meets these requirements.

Following the satisfactory completion of clearance-air monitoring, remaining barriers may be removed and properly discarded as non-asbestos containing waste. If contamination exists behind these critical barriers, additional cleaning and air monitoring may be required.

Final visual will be conducted by at least one Owner's agent/site representative. Owner's agent/site representative may supply additional personnel for inspection in order both to speed the inspection and to more thoroughly inspected the containment areas.

Owner, Contractor and Owner's agent/site representative shall jointly review the work area and make a damage assessment, after clearance air samples have passed and containment has been torn down.

Altadena Library

SECTION 18. CLEARANCE AIR MONITORING

Following the completion of clean-up operations, the Contractor shall notify the Owner's agent/site representative in writing that work areas are ready for final visual inspection. This notification is to be made only after Contractor foreman has made a visual inspection of his own.

After the Owner's agent/site representative has given a final written approval of the clean-up operations, the Contractor shall proceed to "lock-down" the containment area with an encapsulant. Exception to this is for containments that are not to be encapsulated prior to clearance air testing according to the Scope of Work (i.e. floor tile only projects).

When required, clearance air sampling shall be performed following the requirements specified in Section 18 after encapsulation of the containment has taken place and a sufficient amount of time has passed to allow the encapsulant to dry. The Owner shall determine the method of analysis to be used based on the amount and type of material removed within a containment. If at a K through 12 site and the quantity of Asbestos-Containing Material (ACM) exceeds 160 square feet or 260 linear feet, analysis of air samples must be by transmission electron microscopy (TEM) per US EPA AHERA regulations.

Owner shall then arrange for an Air Monitoring Professional to sample the air in the work area for airborne fiber concentrations. Clearance-air monitoring shall proceed 24 hours after lock-down or when the area is dry, whichever is later.

Contractor may request a reduction in the 24-hour waiting period, if personal samples collected during the abatement work and detail clean-up work have shown fiber levels below the PEL. Reduction of waiting period must be made in writing, accompanied by personal sample results from this project. Contractor must acknowledge that reduction in waiting period may result in failed, or overloaded (with encapsulant) clearance air samples and that retaking and re-analyzing these air samples will be at the Contractor's expense. Reduction in waiting time will be at the discretion of the Owner's agent/site representative and the Owner.
Air samples will be taken using the "aggressive" air sampling techniques described in the AHERA regulations unless noted differently in the Scope of Work for non-AHERA sites. In the case aggressive samples cannot be collected (e.g. in a dirt floor area) this will be noted in the Owner's agent/site representative's notes.

If PCM analysis is used for clearance air samples, all clearance samples at all locations shall indicate a fiber concentration of less than or equal to 0.01 f/cc for release of the work area.

If TEM analysis is to be used for clearance air samples, then the clearance criteria shall be the same as AHERA, unless otherwise specified in the Scope of Work.

Areas exceeding these levels shall be re-cleaned and, if appropriate, re-encapsulated at no additional cost to the owner. All areas where clearance air samples fail will be re-tested.

The Contractor shall be responsible for all subsequent air-sampling costs if air samples fail to meet clearance criteria levels. This cost includes four hours of time for Owner's agent/site representative personnel to collect the air samples and the cost of laboratory analysis.

SECTION 19. MONITORING

Owner reserves the right to perform air and performance monitoring at any time.

Contractor shall provide personal air monitoring in accord with OSHA regulations. Results shall be made available to the Owner's agent/site representative within 72 hours of collection. Hard copies of these results shall be supplied to the Owner's agent/site representative within 7 days of collection. Failure to supply these sample results in specified time may cause work to be stopped until all delinquent results have been submitted. Loss of Contractor work time because of non-compliance with the provisions of this paragraph will not extend the date for work completion.

Owner's agent/site representative may take air samples prior to, during, and after the project. Work shall not be considered complete until all air sampling has been completed and satisfactory levels have been obtained. "Satisfactory levels" shall be those established by AHERA, unless more stringent requirements have been identified in any other section of this Specification.

In areas where soil contamination may be present, soil samples must meet specified criteria in any other section of this Specification prior to clearance air samples collection.

Owner, or Owner's agent/site representative, shall be authorized to issue a STOP WORK order whenever Contractor's work or protective measures are not in accord with published regulations or contract specifications.

SECTION 20. DISPOSAL PROCEDURES

Part 20.1 - Disposal Procedures

Waste transport and disposal personnel must wear at least half mask HEPA-cartridge type respirators when handling intact sealed bags. If any bags are broken or if visual debris is observed, powered air respirators (HEPA-filtered) must be worn.

Disposal bags shall be of 6 mil poly, pre-printed with labels as required by CDPH, Toxic Substance Control regulations.

Disposal drums shall be metal or fiberboard with locking ring tops to be used only if required and/or allowed by selected dumpsite.

Stick-on labels as per OSHA and Cal/EPA requirements for disposal containers shall be provided. All containers shall be labeled in accordance with Cal/EPA regulations that require a "Caution" label and a "Hazardous Waste" label with the generator's name, address, and Manifest Document number.

As the work progresses, to prevent exceeding available storage capacity on site, sealed and labeled containers of asbestos-containing waste shall be removed and transported to the prearranged disposal location.

Disposal must occur at an authorized site in accordance with regulatory requirements of NESHAP and applicable State and Local guidelines and regulations, including the California State Department of Health Services, Toxic Substances Control Division.

Transport vehicles shall be marked with the sign prescribed by OSHA during loading and unloading to warn people of the presence of asbestos.

All dump receipts, trip tickets, waste manifests, NESHAP Waste Shipment Record (WSR) and other documentation of disposal shall be delivered to the Owner, for its records. The WSR is not required if the cubic yards of asbestos-containing waste is indicated on the Waste Manifest. The manifest should be signed by the Owner, the hauler, and the Disposal Site Operator as the responsibility for the material changes hands. If a second hauler is employed, his name, address, telephone number and signature should also appear on the form.

The WSR, if used, shall be signed by the Owner or its agent and the disposal site operator.

All manifests shall have asbestos waste identified as: "RQ, Asbestos, 9 NA2212, III". This requirement may be changed as new regulations are issued. See "Waste Disposal" requirements at end of "General Requirements".

All manifests shall be accompanied by a "Notice and Certification". A signed copy of this must be provided to the Owner or its agent.

Altadena Library

Part 20.2 - Transportation to the Landfill

Once drums, bags and wrapped components have been removed from the work area, they shall be loaded into an enclosed (solid walls, ceiling and floor) truck or waste container, which has been lined with 6 mil poly sheeting (walls and floor).

When moving containers, utilize hand trucks, carts and proper lifting techniques to avoid back injuries. Trucks with lift gates are helpful for raising drums during truck loading.

Personnel loading asbestos-containing waste shall be protected by disposable clothing including head, body and foot protection and, at a minimum, half-face, air-purifying, dual cartridge respirators equipped with high-efficiency filters. Any debris or residue observed on containers or surfaces outside of the work area resulting from clean up or disposal activities shall be immediately cleaned up using HEPA filtered vacuum equipment and/or wet methods as appropriate.

No waste containers shall be on site, which contain other hazardous waste, or hazardous waste from any other source or job site. Waste from multiple sites of the Owner within the same waste container is acceptable; however, it must be manifested separately.

If Contractor is storing waste from various sites of one owner, all transportation vehicles shall be covered by the same regulations as the waste container or truck being used to haul the waste to the dump. If equipment or supplies are to be left in vehicles during hauling of waste to waste container or truck, waste and equipment/supplies must be separated by a solid (wood or metal) barrier which has been sealed as a critical barrier. A poly wall barrier is not sufficient.

Waste container, truck, or storage bin must be locked at all times except when being filled.

It is the Contractor's responsibility to see that all waste containers, trucks, and storage bins arrive on site completely free from debris.

The contractor shall provide a weight receipt that identifies the net weight of the material being discarded.

Part 20.3 - Disposal at the Landfill

Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading of the asbestos-containing waste.

Bags, drums and components shall be inspected as they are off-loaded at the disposal site. Material in damaged containers shall be re-packed in empty drums or bags as necessary. (Local requirements may not allow the disposal of asbestos waste in drums. Check with appropriate agency and institute appropriate alternative procedures.)

Waste containers shall be placed on the ground at the disposal site, not pushed or thrown out of the trucks (weight of wet material could rupture containers).

Personnel off-loading containers at the disposal site shall wear protective equipment consisting of disposable head, body and foot protection and, at a minimum, half-face, air-purifying, dual cartridge respirators equipped with high-efficiency filters.

Following the removal of all containerized waste, the truck cargo area shall be decontaminated using HEPA vacuums and/or wet methods to meet the no visible residue criteria. Poly sheeting shall be removed and discarded, along with contaminated cleaning materials and protective clothing, in bags or drums at the disposal site.

Altadena Library

SECTION 21. PATENTS AND PREVAILING WAGES

Part 21.1 - Patents

Contractor shall pay all royalties and license fees required for the performance of the work. Contractor shall defend suits or claims resulting from Contractor's or any Sub-contractor's infringement of patent rights and shall indemnify Owner and Owner's representative from losses on account thereof.

Part 21.2 - Prevailing Wage Requirements

The asbestos abatement contractor is fully and totally responsible at all times for compliance with payment of prevailing wage rates pursuant to provisions of the California Labor Code, for compliance with Division 2, Part 7, Chapter 1, California Labor Code, including but not limited to Section 1776; and for compliance with California Labor Code, Section 1777.5 for all apprentice able occupations.

SECTION 22. PERMITS AND FEES

If any permits are required to be issued for any of the Work to be performed by Contractor, Sub-contractor(s) or Sub-subcontractor(s) as part of the Project, it shall be the sole responsibility of the Contractor to expeditiously obtain all such permits and any costs incurred by the Contractor in obtaining such Permits shall be included within the Contract Price.

SECTION 23. SPECIFIC PROCEDURES AND REQUIREMENTS

NOTE: All Specific Procedures and Requirements listed in Section 20 shall be reviewed by the Contractor along with the Scope of Work issued for the project. If any perceived conflicts are present between the Scope of Work and these specifications or within the General Requirements specification itself, the Contractor shall ask for a written interpretation from the Owner's agent/site representative prior to submission of his bid. If conflicts in the "Scope of Work" and this specification or with the General Requirements specification itself are discovered after the start of abatement, the more stringent specification and/or requirements will be enforced. The Owner's agent/site representative shall make the determination as to what which requirements and/or specifications are more stringent.

Part 23.1 - General Repair of Damaged Thermal System Insulation (TSI)

Where TSI has been damaged, and it is feasible to repair the small nicks, cuts, and exposed ends, the following procedures shall be performed:

1. Piece of 4-6 mil poly sheeting shall be placed directly under the area to be worked to collect any fallen debris or repair compound.

2. Half-masks and disposable suits (at a minimum) shall be used during this work.

3. The area shall be restricted to those personnel involved in the work, so posting of the accesses is required. In some cases, poly shall be used to cover the access points.

4. A HEPA vacuum must be in the immediate area to pre-clean any debris observed surrounding the damaged section, or in the event of a mishap.

5. If work is performed indoors, the ventilation system shall be off in the areas worked in to prevent fiber distribution. Ventilation supply and exhaust ducts shall be covered with poly sheeting.

6. It will be necessary to remove small sections of other insulation material, such as fiberglass, if debris from the damaged pipe covering has contaminated it.

7. In some cases HEPA vacuuming the damaged section will collect all loose, hanging, friable insulation material prior to any further repair work.

8. Very small cracks, holes, nicks, and cuts can be repaired with only a joint compound or with a single layer of wettable cloth and appropriate bridging encapsulant. Larger sections of damaged pipe covering, particularly where pipe hangers or metal channel have damaged the insulation, will require at least two layers of wettable cloth such as HardCast by Carlisle Industries.

9. Where the pipe covering cannot be removed completely from penetrations in the walls, floors, or ceilings, the pipe covering shall be removed at least 1" into the opening and sealed with a bridging encapsulant to grade. The Contractor may choose to fill large gaps with fiberglass insulation, prior to sealing with the encapsulant.

10. All of the Contractor's materials, including poly sheeting, tape, joint compound, etc. shall be removed at the completion of the work performed.

Part 23.2 - Glove Bag Technique Requirements

Where glove bag technique is specified for removal of Thermal System Insulation (TSI), or in those areas where the Contractor opts to use glove bags, all of the following conditions must be met:

1. The Contractor shall follow the procedures recommended by the manufacturer of the glove bags, and the specifications required by Federal OSHA and Cal/OSHA regulations.

2. All critical openings shall be sealed prior to set up of the containment.

3. At least one layer of 6 mil poly must be used to fully enclose/contain the abatement area.

4. Stationary objects in the immediate area of the room which cannot be removed from the work area must be covered with at least one layer of 4 mil poly sheeting after being pre-cleaned.

5. A minimum three stage decontamination unit with a shower shall be contiguous with the containment for areas requiring removal of more than 6 linear feet of TSI, or 10 square feet of surfacing material.

6. Negative pressure shall be established and a circular graph recording manometer shall be attached to the containment per Section 13.

7. A HEPA filtered vacuum shall be in the immediate area for use in conjunction with the bags or in case of a spill.

8. Glove bags may not be used on surfaces where temperatures exceed 150 degrees Fahrenheit.

9. Glove bags may be used only once, and may not be moved or slid for removal of a second section of TSI.

10. At least two persons shall perform Class I glove bag removal as defined by Federal and Cal/OSHA.

11. Before beginning the operation, loose and friable material adjacent to the glove bag operation shall be wrapped and sealed in two layers of 6 mil poly sheeting or otherwise rendered intact.

12. Where the system uses an attached waste bag, such bag shall be connected to a collection bag using a hose or other materials which shall withstand pressure of ACM waste and water without losing its integrity.

13. The Contractor shall apply a sufficient volume of amended water to all pipe covering scheduled for removal while it is enclosed in the glove bag.

14. A sliding valve or other device shall separate the waste bag from the hose to ensure no exposure when the waste bag is disconnected.

15. Prior to placement in the disposal bag, glove bags shall be collapsed by removing air within them using a HEPA filtered vacuum.

16. Upon detachment, the glove bag must be immediately placed into at least two 6 mil thick disposal bags. The disposal bags must be sealed using the "gooseneck" sealing technique.

17. Where pipes enter walls, floors, or ceilings which are not within the scope of the project, the pipe covering shall be removed at least 1" into the structure and the pipe covering end must be sealed with bridging encapsulant and/or wettable cloth.

18. If the Contractor chooses to use a Negative Pressure Glove Bag System, Negative Pressure Glove Box System, or Water Spray Process System in lieu of the traditional Glove bag System, the Contractor shall submit to Owner's agent/site representative detailed written procedures on those systems which will be used. In addition, air sampling data, generated by the Contractor, must be provided to Owner's agent/site representative. Owner's agent/site representative must provide prior approval to alternate techniques and approaches to those specifications detailed here.

19. The Contractor is responsible for salvage and decontamination of all pipe system supports, hangers, brackets, saddles, etc. These items shall be inventoried by the Contractor, and verified by the Owner's agent/site representative before and after abatement. The Contractor will be responsible for replacement of any items lost or damaged.

20. The Contractor shall be responsible for ensuring the piping system remains adequately supported at all times. This may be achieved by readjusting existing hanger brackets as insulation is removed, or by other approved methods, such as inserting wood blocks to replace the thickness of the removed insulation.

Part 23.3 - Mini-Cube Enclosure Requirements

1. For the purposes of these specifications, "mini-cube enclosure", enclosure", "mini-enclosure", and "mini-cube" are all used interchangeably and mean the same. The mini-cube enclosure is required to be constructed whenever small sections of walls, ceilings, or pipe insulation are to be removed for electrical, plumbing, mechanical, etc., work. The purpose is to create an enclosed and controlled work environment while removing asbestos or accessing an attic space which is contaminated.

2. Enclosure walls and floors must be constructed of at least two layers of fire-rated 6 mil poly sheeting. No visible holes, cracks, penetrations, etc. shall be within this enclosure. The upright frame shall be adjustable in order to butt the top of the enclosure to the wall or ceiling area. A single drop layer of 6 mil poly sheeting shall be put down and removed daily at the end of the work shift. For work involving removal of TSI by glove bag technique, only one layer of 6 mil poly sheeting is required for construction of the mini-enclosure.

3. Since the top of the enclosure must be open in the chamber where ceiling access will take place, special care must be taken prior to moving the enclosure. If the mini-enclosure is designed to be portable, the enclosure must be sealed at the top prior to being moved to the next location. This may be achieved by temporarily sealing the top with poly and tape from the inside.

4. For access to an attic space, position the enclosure at the location to be worked. The enclosure must be butted up to the ceiling surface to form a semi-seal between the top of the enclosure and the ceiling. The enclosure can then be completely sealed to the ceiling, using tape. After a seal has been established, access into the ceiling can then proceed.

5. A HEPA vacuum shall be used to establish "negative pressure" or airflow into the enclosure. This

shall be verified by using ventilation smoke tubes.

6. The following equipment and materials, at a minimum, must be present inside the mini-enclosure "dirty" chamber:

- 6 mil poly bag for waste.
- Flashlights or drop light as appropriate.
- Daily change of 6 mil poly sheeting drop layer. Other tools needed to perform task.
- Clean potable water in a Hudson-like sprayer, which is labeled "Clean Potable Water Only".
- HEPA Filtered Vacuum

7. The outside of the poly-flapped entry to the mini-cube must be posted with OSHA required warning signs.

8. Clean disposable coveralls must be worn entering the mini-enclosure, and must be removed prior to leaving the mini-enclosure. Depending upon the work being performed, the Contractor may choose to "double suit" in disposable coveralls. All workers shall use the Clean Room and its supplies for personal hygiene prior to exiting the enclosure.

9. For work involving removal of more than 6 linear feet of TSI, or greater than 10 square feet of surfacing material (regardless of method to be used), a shower must be attached to the mini-cube enclosure and be contiguous with the work environment, and comply with all other requirements in related sections of this Specification.

10. If there is removal of greater than 3 linear feet of TSI, or greater than 3 square feet of surfacing material (regardless of the method used), the enclosure must remain in place until a final visual is passed, and clearance air samples are collected by Owner's agent/site representative. Where work involves less than these quantities, only a final visual inspection by Owner's agent/site representative will be required prior to removal of the mini-enclosure.

Part 23.4 - Roofing Abatement Requirements General Requirements

1. Except as amended here and in Section 24, Asbestos Specification/ Procedures, all other Sections of this Specification shall be followed.

2. The work shall be coordinated and scheduled when there are favorable weather conditions, such as, performing the abatement work when the forecast is for "clear skies" and no rain for three or more consecutive days. The Contractor shall remove only that amount of roofing material, which can be re-roofed or covered, and secured from the weather.

3. Work may be halted at the discretion of the Owner's agent/site representative if wind conditions occur which can or does cause removed roofing materials to be blown off the roof area, or beyond the designated removal area perimeter. All roofing work shall be coordinated to allow other trades to work at the same time as long as their work is located in areas where contamination cannot occur. No cutting, sanding, grinding, or removal of any type will take place until all preparations for removal have been completed and inspected by the Owner's agent/site representative. This section may be amended in other sections of this Specification for this project.

4. The words "clear skies" are used as a means of indicating favorable weather conditions. These two words do not mean, nor are they intended to require skies be clear and free of clouds, fog, or other

5. meteorological conditions which are not expected or forecast to produce measurable rain. The follow up requirement of no rain for three or more consecutive days is to help clarify the favorable weather condition requirement. The last sentence concerning the amount of roofing to be removed is to further instruct and direct the Contractor not to be over optimistic and create more open roof areas than can be re-roofed, secured, or properly protected from weather in case the forecast changes unexpectedly or without warning.

6. All work hours at the site shall be determined by the Owner or as defined in other sections of this Specification. Unless otherwise stated, the buildings will be reoccupied each morning Monday through Friday.

7. All work shall be coordinated with the other trades involved on this project, with central coordination being primary between the abatement Contractor and the General Contractor for the project. However, Owner's agent/site representative must be notified of projects in advance as stated in other sections of this Specification.

8. The Contractor shall provide all necessary equipment, tools, materials, lighting, labor, etc. to perform the work. Sufficient lighting shall be provided to illuminate the entire removal and transit areas for removal of roofing material, and for the final visual inspection by the Owner's agent/site representative if the work is to be performed at night.

9. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition. HEPA equipment to be used inside any building must have been DOP tested within the last 90 days. This DOP certification must be verified by Owner's agent/site representative prior to its use.

10. The Contractor shall provide worker safety according to all OSHA regulations (Title 8), including use of tie-offs, harnesses, and lanyards. Particular attention shall be given to the placement and securing of accesses (ladders, etc.) to the roof.

11. All ladders used shall conform to Cal/OSHA requirements. The ladders shall extend at least three feet above the roof line, and shall be tied off to the building to prevent them from sliding.

Contractor Responsibilities

1. The Contractor shall be responsible for securing all exposed roof surfaces, including any roof penetrations against weather after roofing materials have been removed. Protection of the roof must be made with an impermeable barrier to prevent water from entering the building structure.

2. The Contractor will be responsible for all clean-up and costs associated with the decontamination of occupied spaces in the event of contamination of an occupied space.

3. The Contractor is responsible for any contamination of the attic space above the existing ceilings inside the buildings caused by their work, except as noted specifically in Section 24, Asbestos Specification/Procedures.

4. The Contractor is responsible for damage to the roofing substrate, and will be responsible for repair or replacement if damaged.

5. The Contractor is responsible for removal of all roofing layers and associated materials such as roofing nails, insulation, fiberboard, etc. down to the wood or metal substrate regardless of asbestos content, unless otherwise noted in Section 24, Asbestos Specification/ Procedures. Where it is unknown how many layers of roofing materials exist, it must be assumed that there are multiple roofing layers present. The Contractor may, upon request and approval by the Owner, collect core samples of any roof to be removed for the purpose of determining its depth and structure. If coring is conducted, it is the responsibility of the Contractor to repair to industry standards using non-asbestos materials the areas affected.

6. The Contractor is responsible for removing all roofing nails, and driving in all nails used for securing the roofing substrate after roof material has been removed. The Contractor will not be required to remove silver painted or tar coating on conduit, roof jacks, heating, ventilation, and air conditioning (HVAC) equipment, flashing, etc. which will be reused by the Owner. Where flashing is to be reused, the Contractor shall carefully remove and save the flashing in an undamaged condition, unless otherwise required by the Owner. This section may be amended in Section 24, Asbestos Specification/Procedures for this project.

7. The Contractor is responsible for removal and replacement of wood block or metal supports which may be present under conduit, gas lines, piping, HVAC units, ducts, etc. in order to perform the work. The Contractor is also responsible for temporarily installing wood blocks for any existing roof structures during the roofing removal, when it is necessary to remove existing support members to accomplish the work.

8. The Contractor is responsible for damage to all equipment and existing cables which are present on the roof. The Contractor is responsible for damage to electrical wiring, telephone lines, antenna wires, and other conduits which are present. An inspection for pre-existing conditions is the responsibility of the Contractor, but may also be conducted by Owner's agent/site representative.

9. The Contractor is responsible for obtaining all necessary permits to perform this work, including any local permits for work in the evening/night hours.

10. Standards of cleanliness for fluted metal decks located underneath asbestos-containing roofing materials. It is possible for the abatement crew to remove the asbestos-containing roofing materials without breaking through or removing the light grey insulation material beneath it. If removal of asbestos roofing materials is performed as described above, and the insulation material remains intact, Owner's agent/site representative can conduct a final visual for asbestos-containing debris. Once this inspection has been completed, and the requirement for no remaining asbestos-containing debris on the roof is met, the insulation layer is removed.

    At this point, asbestos is no longer an issue, and Owner's agent/site representative will allow minor amounts of the non-asbestos debris to remain in the fluted areas of the deck. General cleaning of the flutes is conducted to a point where the amount of debris remaining is reduced to a minimal amount without having to completely clean or vacuum the flute channel.

    The Owner is unaware of any potential hazard which could be caused by leaving some non-asbestos debris, and does not consider it necessary to have the flute channels detailed beyond generally clean conditions. However, if the fiberboard layer is extensively damaged during removal of the asbestos-containing materials, and asbestos-containing roofing debris cannot be distinguished from non-asbestos containing roofing materials, all flutes shall be vacuumed and cleaned as set forth in the project specifications.

Owner Responsibilities

1. The Owner is responsible for closing all windows in the building where the asbestos roofing material will be removed. This must be done prior to the asbestos abatement contractor arriving onsite for the work shift, in order to prevent delays.

2. The Owner shall also be responsible for cutting or trimming back all trees and limbs which may impact the removal of the existing roofing materials.

3. It is assumed that the buildings associated with this project have roof decking which may include any number of construction methods which allow for roofing debris to sift into joist spaces, or attics located beneath areas where roofing may have previously been removed. Therefore, it must be assumed that all inaccessible and accessible attic spaces, joist spaces, and even flutes of metal decks involved with this project will become, or have already been contaminated with asbestos, and

shall be noted in the Management Plan.

4. The Owner acknowledges that the removal of any roofing materials during this project will result in contamination of the attic spaces, and assumes any associated responsibilities.

General Roof Removal Instructions and Requirements

1. Removal of non-friable asbestos-containing roofing is designated as Class II work. Half-face respirators and disposable coveralls shall be used at a minimum by all workers, at all times, when within the regulated area.

2. No personnel will be allowed into the regulated area during actual removal work without proper respiratory and personal protective equipment. Work boots with hard soles are required to be worn by all abatement personnel. No athletic, street, or dress shoes are to be worn during work activities.

3. All roofing material shall be removed in an intact state to the extent feasible.

4. All roofing is to be removed wet by an amended water solution or encapsulant as necessary.

5. The abated roof area shall be HEPA vacuumed after roofing materials have been removed. Particular attention shall be directed at the flute channels of metal decks.

Additional Requirements for Removal of Nicolite (Nicolet) Roofing Felts

1. Set up of perimeter barriers shall be extended to 30 feet from roof edge at ground level. Contractor shall be required to use barrier tape stamped with, “DANGER ASBESTOS HAZARD” in black letters on a solid red background.

2. Pre-wetting of materials utilizing amended water must attain complete and thorough penetration of the felts prior to their removal, and additional application of amended water shall be performed as necessary throughout the removal and bagging process.

Pre-Abatement Preparation Requirements

1. The Contractor shall seal all air intakes associated with the HVAC units which are on or near the roof under abatement, and at adjacent HVAC units, particularly downwind from roofing removal activity. In addition, all louvers, window mounted fan systems, attic openings, etc., shall be sealed as critical barriers. The Contractor is responsible for sealing all HVAC openings as critical barriers using one layer of 6 mil poly. These critical barriers shall be installed at the beginning of each shift, and removed at the end of each shift prior to reuse by the Owner. If the building will not be reoccupied daily, the barriers may stay in place.

   The perimeter of the roof where removal is to be conducted, shall be posted with barrier tape at a distance of at least 20 feet from the edge of the removal area. This barrier tape will provide a buffer zone, and assist in the restriction of non-abatement personnel.

   Poly sheeting shall be placed on the ground directly below the work area or on the adjacent roof surfaces at least 10 feet. The Contractor shall secure the poly to the ground using tape, weights, or other means to secure the poly from being picked up by wind or becoming a trip hazard. The Contractor shall secure the poly to the adjacent roof surfaces with tape, etc.

Waste containers and Waste container Preparations

1. The Contractor is responsible for inspecting all waste containers delivered to the job site for load worthiness. The Owner’s agent/site representative reserves the right to refuse any waste container without any additional cost to the client, which upon examination, and in the opinion of the site

representative, has a high probability of failure of doors, skids, walls, floors, or which contains other debris.

2. The Contractor shall be required to place footing materials of sufficient thickness, strength, and size under the casters, footings, and/or runners of waste container(s) to prevent damage of property surfaces. The Contractor is responsible for all damages to Owner's property caused by the delivery, placement, or removal of a waste container. Damaged property shall be repaired to equal or better condition than was present prior to the activity causing the damage. This section may be amended in Section 24, Asbestos Specification/Procedures for this project.

3. Unless the roofing material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane, or hoist. All waste shall be sufficiently wetted with amended water to prevent fiber release. If fiber release cannot be prevented, then the chute and bin must be within a negative pressure enclosure. In no case shall roofing materials be dropped or thrown into bins or waste containers from the roof.

Posting and Label Requirements for:

Regulated Area Entry Points and Waste container Perimeters

Access to regulated areas shall be posted as outlined by Cal/OSHA Title 8, 1529 (k)(7)(B) 1 and 2 with warning signs. Perimeters of waste container(s) shall also be posted as outlined by Cal/OSHA Title 8, 1529 (k)(7)(B) 1 and 2 with barrier tape bearing the following information:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA

These postings are required to warn non-abatement personnel of the restricted access, and potential hazard which exists in the vicinity of the regulated areas and waste container(s).

Building Perimeter at Ground Level

Building perimeters shall be posted with barrier tape bearing one of the following descriptions:

CAUTION in black letters on a solid yellow background.
DANGER in black letters on a solid red background.
DANGER ASBESTOS HAZARD in black letters on a solid red background.

Waste Material Containers

Waste material containers, including the "burrito wrapped" material, shall have warning labels affixed in accordance with Cal/OSHA Title 8, 1529 (k)(8)(A-D).

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

Altadena Library

Waste Disposal and Documentation Requirements

1. Roofing waste may be disposed as non-hazardous asbestos waste, in a landfill permitted to accept non-friable, non-hazardous asbestos roofing material. If the asbestos roofing material is currently friable, or becomes friable during its removal, it shall be disposed of in a landfill permitted to accept friable asbestos waste.

   It is acceptable to dispose of bagged or sealed roofing waste into open topped waste containers lined with a single layer of 10 mil poly sheeting. The Contractor shall completely enclose all roofing waste material commonly known as "burrito wrap" in the waste container using 10 mil poly sheeting. Upon being lowered, unwrapped material shall be transferred to a closed receptacle in such a manner as to preclude the dispersion of dust. In addition to the 10 mil poly sheeting, the top of the waste container shall be completely enclosed with a tarp which is secured to the vehicle for transport or storage on-site if left overnight. The type of material for the tarp shall meet all requirements for transport of hazardous materials.

2. The Contractor is required to provide to Owner's agent/site representative a copy of the "trip tickets" indicating the actual weight of waste material.

Visual Inspection Forms-Interior and Exterior (Roof Removal Shifts Only)

The Owner's agent/site representative shall conduct visual inspections inside each building space prior to each work shift to determine existing conditions, including loose or dislodged acoustical ceiling tiles.

In addition, all interior spaces directly below the area of work shall be visually inspected by the Owner's agent/site representative, at the end of the work shift, to inspect for roofing debris and for loose or dislodged ceiling tiles, etc.

The Contractor is responsible for all costs associated with clean-up of any debris which falls in the occupied spaces of the building.

The Contractor is responsible for providing adequate lighting during all phases of work. This includes final visual inspection by the Owner's agent/site representative, of the removal area and adjacent surfaces impacted during the work.

The Contractor shall perform a pre-final visual of the removal area and adjacent surfaces prior to requesting that the Owner's agent/site representative conduct a final visual inspection. The pre-final visual performed by the Contractor shall verify that all materials have been completely removed from the work area as specified, and all poly sheeting or tape placed over any vents or equipment, which has been removed. The Contractor will also verify that all perimeter poly sheeting on adjacent surfaces has been picked up, and all debris generated by the roofing work such as gutters, flashing, roofing products, paper, nails, screw, etc. have been placed into the waste container.

Protection of Accessible Attic Areas

Any plumbers plenums which may be located below areas where roof removal will take place and the roof deck is not constructed of plywood or solid sheet metal, shall be protected with poly barriers prior to work being performed. Any and all debris which may get into a plumbers plenum will be the responsibility of the Contractor and must be cleaned up by the abatement contractor. A final visual inspection by Owner's agent/site representative will be required prior to allowing the abatement contractor to move to the next designated removal location.

Caulking and Poly Barrier Requirements

Roof removal may cause dust and debris to enter attic areas through gaps between roof deck boards. This dust and debris could enter the interior building areas through gaps and penetrations in the ceilings. The

Contractor shall caulk all identifiable gaps in the ceilings (excluding areas specified to be protected with poly barriers). Typically this will require caulking along curtain tracks, lowering lighting trim to caulk around junction boxes, and caulking gaps around the ceiling edges. The Contractor is responsible for all costs of decontamination and clearance sampling of interior areas, other than inaccessible attics and plumbing plenums, if dust and debris fallout occurs.

All caulking work shall be performed using an Owner approved, paintable material which matches the existing color of the surface, and shall be applied to industry standards with a smooth finish. Caulking must be performed at least five days prior to roof removal work to allow Owner's agent/site representative time to inspect the work completed.

Exterior corridor areas shall not require caulking, however, all grooves shall be thoroughly cleaned of debris by HEPA vacuuming immediately following roof removal. When construction of an overhang or covered walkway is such that prolonged fallout of roofing debris can be expected to occur, the Contractor shall install and maintain a poly barrier below the roof substrate until debris fallout has ceased.

Where exposed tongue and groove wood or roofing substrates are visible, which do not provide a solid barrier between the roof deck and the interior of a building exist, the Contractor may choose to install poly barriers in lieu of caulking. These poly barriers must be air tight and secured to the building surfaces. Spray glue shall not be used to attach any materials to any building surfaces. These poly barriers shall remain in place for the duration of the roof removal and roof replacement activities. During the removal of the poly barriers, the Contractor shall carefully process all asbestos debris captured, either by wetting, HEPA vacuuming, or both, to prevent loss of debris and contamination of interior spaces. The Contractor is responsible for any damages to interior surfaces, and shall repair all finishes to the Owner's satisfaction.

Part 23.5 - Vinyl Floor Tile (VFT) & Associated Adhesive Abatement Requirements General Requirements

For the purposes of this project any direction to remove asbestos-containing or assumed asbestos-containing VFT shall include the full removal by the abatement contractor of the adjacent base cove, as well as, the adhesive/mastic used to secure the VFT and/base cove regardless of its asbestos content. Any mastic which has not been tested for asbestos content must be assumed to contain asbestos and removed by the abatement contractor prior to the performance of a final visual by the Owner's agent/site representative, and final air testing of the containment.

Removal of more than 100 square feet of contiguous asbestos-containing VFT shall require a full enclosure/containment be constructed prior to removal. Any full enclosure/containment constructed for the purposes of removing asbestos-containing VFT, and/or the adhesive/mastic used to secure the VFT and/base cove, shall include critical barriers, a temporary poly ceiling fully connected to poly walls, a sufficient number of DOP tested negative air units to attain a level of at least -0.025" of negative air pressure within the containment, a circular recording manometer, and at a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The filtration system must have at least a 5.0 micron particle size collection capability. Documentation of this capability shall be provided to Owner's agent/site representative.

Whenever and wherever possible, the Contractor shall enclose multiple rooms within a building or wing into a single containment. Where rooms are joined by a common interior hallway or have a common exterior walkway, multiple spaces shall be joined together creating one containment using poly enclosures. Where multiple rooms in a building do not have a common interior hallway, multiple rooms shall be joined using a common work chamber built by the Contractor. The common work chamber shall be constructed of wood studs and plywood sheeting for security purposes, and shall be part of the decontamination chamber. Decontamination units and joined "common areas" outside of a building shall have lockable doors or gates created with temporary fencing for security during off-hours.

Altadena Library

Where appropriate floor tile adhesive/mastic may be removed either by solvent or wet buffing with a solvent. Bead blasting of materials will only be allowed with approval of Owner. Contractor must declare use of bead blasting to Owner/Owner's Representative prior to use of this method. If a solvent is used, the negative air unit exhaust shall be directed downwind of make-up air vents a sufficient distance to preclude the re-entrainment of vapors back into the building. Any solvents used for removing adhesive/mastic shall be non-toxic, low odor, non-flammable, and compatible with the new flooring adhesive/mastic.

A safety data sheet for the solvent(s) proposed for use shall be provided in the pre-construction submittal package, all solvent(s) must be approved by the Owner's agent/site representative prior to their use.

Except as amended here and in the "Scope of Work" Section, all other Sections of this exhibit shall be followed. No removal of VFT, VFT adhesive/mastic, carpets over VFT, or base cove with "assumed" or known asbestos-containing adhesive shall be performed prior to the approval of the Owner's agent/site representative.

Contractor Responsibilities

1. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

2. All HEPA equipment to be used on the project must be delivered to the site empty of any debris, clean, free of dust, and in full operating condition. HEPA equipment must be DOP tested at the beginning of the set-up phase and prior to installation into the containment or use on the project. Any equipment removed from the site for more than 10 working days must be DOP tested again prior to re-use on the project.

3. DOP certification testing shall be observed and witnessed by an Owner's agent/site representative. Copies of DOP test results and certification must be submitted to Owner's agent/site representative within 24 hours of the testing being performed.

4. All poly sheeting to be used for the construction of full enclosures/containments must be fire retardant. SDS information reflecting this requirement must be submitted prior to use.

5. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials must possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

6. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of asbestos-containing material is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site. The Owner shall also be responsible for arming and disarming alarm systems on buildings where work will be performed.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups if available. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs

necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General VFT & Adhesive/Mastic Removal Instructions and Requirements

1. For the purposes of this project, removal of VFT and associated adhesive/mastic by any method shall be performed by personnel who are properly trained and accredited to perform Class II Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the containment area during actual removal work without proper respiratory and personal protective equipment. At a minimum, this shall include half-face negative pressure respirators, full body coveralls, rubber boots, and gloves. During removal of adhesive/mastic with solvent or other organic based liquid, combination respiratory cartridges (organic vapor/HEPA) shall be worn, by workers to protect against asbestos and the solvent. Rubber gloves shall also be worn to protect workers skin from the solvent material. **No street clothes or shoes shall be worn inside containment during the removal process**.

3. All doors, windows, and penetrations into the room(s) shall be sealed with poly sheeting. All ventilation systems shall be locked-out and sealed with critical barriers of either poly sheeting or plywood sheeting. **No spray glue may be used on any Owner property or building surface.**

4. Full enclosure of the walls and ceiling with poly sheeting will be required, no matter what method of removal is used. Support of ceiling poly will be at the discretion of the Contractor. Ceiling may be constructed of one layer of 4 mil poly sheeting. Walls shall be constructed of one layer of 6 mil poly, and include a splash guard. The splashguard shall be a minimum of 4 feet in height from the base of the wall upward.

5. Based on the size of the enclosure/containment, a three stage decontamination unit shall be put into place and be fully operable. The clean room of any three-stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height.

6. Sufficient negative air units shall be installed which will provide a minimum of four air changes per hour and -0.025" air pressure differential. A manometer with an accurate circular or equivalent recording chart must be installed and operational. The manometer chart(s) shall reflect the location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

7. When the Contractor has passed the pre-start visual inspection, removal of base cove/boards may be conducted. Base cove adhesive shall be removed completely on hard surfaced walls where damage to the substrate will not occur, or only to a point of smoothing out high spots on walls, which will become damaged due to the work to be performed. Full removal is not expected unless the Contractor is notified in writing on these types of soft substrate surfaces.

8. Sufficiently wet VFT with amended water prior to and during the removal phase of work, and place into waste containers for disposal. Acceptable methods of containing VFT waste materials include placing VFT into clear properly labeled 6 mil poly bag and deposit this bag into a lined fiberboard drum. The drum shall be sealed when filled and placed into a waste container for disposal.

9. Method of removal pertaining to asbestos-containing adhesive/mastic shall be at the discretion of the Contractor, except methods, which are noted in this Exhibit that are prohibited. Hand scraping, solvents, and wet buffing with solvents are acceptable methods. If the Contractor chooses to use solvents, exhaust of negative air units shall be directed downwind as much as possible, or a sufficient length of exhaust hose will be required to prevent re-entrainment of the vapors.

10. Any solvents used for removing adhesive/mastic shall be non-toxic, low odor, and non-flammable. A SDS for the solvent shall be provided and subject to approval by the Owner's agent/site representative prior to use.

11. Upon completing the removal of all floor tiles and adhesive/mastic, the Contractor shall remove the splashguard from the containment walls, and conduct wet wiping on all surfaces within the containment/enclosure.

12. If a solvent was used to remove any VFT adhesive/mastic, the Contractor shall wash the floors thoroughly using a solution of trisodium phosphate (TSP), or equivalent, and water. Sufficient water shall be used for final rinsing of the floor for a clean finish.

13. It is the sole responsibility of the Contractor to reduce concentrations of any solvents used to a level, which will allow new adhesive/mastic to be applied. Owner's agent/site representative will not test the floor for PH levels, and will not attest that the solvents used have been reduced in any way.

Final Visual Inspection

1. Upon the completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove/clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed from the floor area. Any three dimensional debris identified by the Owner's agent/site representative, which can be seen using a flashlight placed on the floor and directed across the floor, shall be removed as directed with the use of a HEPA vacuum and other tools as necessary to remove the material. The Contractor shall thoroughly clean all equipment inside the containment, including all parts of the negative air units, and new pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. The asbestos contractor may encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete.

Clearance Criteria

a. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the containment.

Disposal Requirements

1. All vinyl floor tile waste shall be disposed as hazardous asbestos waste and will require a Uniform Hazardous Waste Manifest. Package all solvent/mastic waste created during the project in sufficient absorbent to eliminate all free liquids, and place in a D.O.T. 7A Type A approved steel drum (49 CFR 178.350). Label the drum as required, and transport to an approved Class 1 landfill with a separate Uniform Hazardous Waste Manifest and Waste Profile Documentation.

2. The Contractor **SHALL NOT** sign any Hazardous Waste Manifests for the Owner. It shall be the responsibility of the Contractor to notify the Owner's agent/site representative and coordinate having any manifest properly signed by a Owner representative.

Altadena Library

Part 23.6 - Carpet Removal over Vinyl Floor Tile (VFT)/Tile Adhesive Requirements General Requirements

The following requirements are for use when the only removal to be performed is of carpet applied over existing VFT or bare VFT mastic. If the intended removal includes the underlying materials and/or any associated base cove, refer to and follow the requirements as set forth in Part 23.5 Vinyl Floor Tile (VFT) and Associated Adhesive Abatement Requirements.

For the purposes of this project, any direction to remove carpet from over known or assumed asbestos containing VFT or bare VFT mastic where the carpet is found to be directly adhered to those surfaces by carpet glues or carpet mastic the following requirements shall apply. These requirements shall be enforced regardless of the amount of floor tile/mastic expected to be impacted by the removal process.

1. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

2. All HEPA equipment to be used on the project must be delivered to the site empty of any debris, clean, free of dust, and in full operating condition. HEPA equipment must be DOP tested at the beginning of the set-up phase and prior to installation into the containment or use on the project. Any equipment removed from the site for more than 10 working days must be DOP tested again prior to re-use on the project.

3. DOP certification testing shall be observed and witnessed by an Owner's agent/site representative. Copies of DOP test results and certification must be submitted to Owner's agent/site representative within 24 hours of the testing being performed.
4. All poly sheeting to be used for the construction of enclosures/containments must be a fire rated material. SDS information reflecting this requirement must be submitted prior to use.

5. All personnel used by the Contractor to conduct removal of carpets or handling of asbestos-containing waste materials must possess a current accreditation certificate as an asbestos worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

6. The Contractor shall be responsible for all clean up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of ACM is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

7. Whenever vinyl floor tiles are to be removed, the base cove shall also be removed as part of the project. When the Contractor has passed the pre-start visual inspection, removal of base cove/boards may be conducted. Base cove adhesive shall be removed completely on hard surfaced walls where damage to the substrate will not occur, or only to a point of smoothing out high spots on walls, which will become damaged due to the work to be performed. Full removal is not expected unless the Contractor is notified in writing on these types of soft substrate surfaces. To minimize damage to the existing paint above the base cove, the contractor shall use a utility knife to cut score the paint at the intersection of the base cove. This will allow removal of the base cove with minimal damage to the paint layer.

Altadena Library

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site. The Owner representative shall also be responsible for arming and disarming alarm systems on buildings where work will be performed.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups if available. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General Carpet Removal Instructions and Requirements

1. Carpet removal shall be performed by personnel who are properly trained and accredited to perform Cal/OSHA Class II Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the containment area during actual removal work without proper respiratory and personal protective equipment. At a minimum, this shall include half-face negative pressure respirators with P-100 (HEPA) cartridges and full body coveralls.

3. All ventilation systems shall be locked-out and sealed with critical barriers of poly sheeting. Other penetrations such as doors, vents, etc. must also be sealed with either tape or poly sheeting as appropriate to secure the work area. A single stage cubicle unit of appropriate size for the work to be performed shall be placed on the entrance to the room. At a minimum this unit must be 3' X 3' X 6' in height. **No spray glue may be used on any Owner property or building surface.**

4. A remote clean-up and decontamination unit shall be put into place in a location considered to be central to the work being performed. This decontamination unit shall be equipped with a full shower unit, overflow pan, filtration unit, soap, warm and cold water, towels, etc. as required in other sections of these specifications. Decontamination procedures will be based on the actual amount of asbestos- containing materials impacted during the carpet removal. As a guide, if more than 100 square feet of VFT are impacted during carpet removal, the personnel performing the work shall shower at the end of each work period. If less than 100 square feet of VFT or VFT mastic are impacted during the process modified worker decontamination practices may be used.
5. A sufficient number of pressure differential units shall be installed which will provide a negative air flow and minimum of 4 air changes per hour. A manometer will not be required. Once these requirements have been met and the enclosure area has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

6. When the Contractor has passed the pre-start visual inspection, removal of carpet may be conducted.

7. VFT adhered to the surface of the existing substrate will be removed from the carpet utilizing hand methods and hand tools as needed. These tiles shall be placed into waste containers for disposal. If all VFT has been removed from the carpet the carpet may be disposed as regular waste with no restrictions. However, the carpet may not be salvaged without written authorization from the Owner.

8. Any carpet removed from bare VFT mastic and the mastic remains adhered to the carpet will require the carpet be wrapped in two layers of polyethylene sheeting properly labeled to meet Cal/OSHA requirements and disposed as a non-hazardous asbestos containing waste in an appropriate landfill permitted to accept such waste.

Final Visual Inspection

1. Regardless of the amount of VFT or VFT mastic impacted, upon the completion of all activities listed

above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove/clean additional surfaces as needed.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the cleanliness of the work area. All surfaces, fixtures, and cabinetry exposed to the work shall be wet wiped and found to be free of existing dust and possible debris generated during the carpet removal process. Any loose or broken tiles and tile debris must be removed by the contractor prior to acceptance of the work area as complete.

3. Lockdown of the removal area will not be required.

Clearance Criteria

1. Owner's representative will determine if clearance air samples will be required based on actual impact of VFT or VFT mastic determined by the final visual inspection. If clearance air monitoring is performed, all samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor will be the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the containment.

Disposal Requirements

1. All vinyl floor tile waste shall be disposed as hazardous asbestos waste and will require a Uniform Hazardous Waste Manifest. The Contractor **SHALL NOT** sign any Hazardous Waste Manifests for the Owner. It shall be the responsibility of the Contractor to notify the Owner's agent/site representative and coordinate having any manifest properly signed by a Owner representative.

Part 23.7 - Boiler Unit Removal Requirements

Regardless of boiler size or method of removal, the entire Boiler Room shall be wet wiped and cleaned of all visible dust, dirt, etc. prior to final visual inspection and clearance air monitoring to be performed by the Owner's Representative. If the boiler unit is to be demolished in place full enclosure shall be required. This will include poly barriers on floors, walls, and ceilings as appropriate in addition to all other requirements set forth in this document, which constitutes a full enclosure.

Removal of the unit whole will still require at a minimum the following:

1. All critical openings shall be sealed with at least one layer of six mil thick poly sheeting.

2. Negative pressure shall be established and a circular graph-recording manometer shall be attached to the containment per Section 13.

3. A three-stage decontamination unit with an operable shower shall be attached to the entrance of the containment.

4. HEPA-filtered vacuums and wet wiping techniques shall be used for detail cleaning of all surfaces.

5. Before beginning the operation, repairs shall be performed on any damaged thermal system insulation in the room, which is not scheduled, for removal or replacement during the boiler removal operation.

Altadena Library

Part 23.8 - Sheetrock and Joint Compound Abatement Requirements

General Requirements

For the purposes of this project any direction to remove sheetrock and joint compound wall and ceiling system materials known to contain <1% asbestos as a composite material and verified by the point count method shall include the full removal by the abatement contractor of all nails, screws, or other fastening units which have visible sheetrock and/or joint compound remaining, as well as, all dust, debris, and waste generated by the removal work.

Removal of more than 100 square feet of contiguous asbestos-containing sheetrock and joint compound wall and/or ceiling systems shall require a full enclosure/containment be constructed prior to removal. Any full enclosure/containment constructed for the purposes of removing asbestos-containing sheetrock and joint compound wall and/or ceiling system materials, shall include critical barriers, a temporary poly ceiling fully connected to poly walls (as appropriate for surfaces not being removed), a sufficient number of DOP tested negative air units to attain a level of at least -0.025" of negative air pressure within the containment, a circular recording manometer, and at a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. The filtration system must have at least a 1.0 micron particle size collection capability. Documentation of this capability shall be provided to Owner’s agent/site representative.

Removal of less than 100 square feet of asbestos containing sheetrock and joint compound wall and/or ceiling system materials shall require a full enclosure/containment be constructed prior to removal. However, the use of a two-stage decontamination unit will not be required and negative pressure requirements may be reduced to verification of negative airflow. All other containment requirements apply.

Whenever and wherever possible, the Contractor shall enclose multiple rooms within a building or wing into a single containment. Where rooms are joined by a common interior hallway or have a common exterior walkway, multiple spaces shall be joined together creating one containment using poly enclosures. Where multiple rooms in a building do not have a common interior hallway, multiple rooms shall be joined using a common work chamber built by the Contractor. The common work chamber shall be constructed of wood studs and plywood sheeting for security purposes, and shall be part of the decontamination chamber. Decontamination units and joined “common areas” outside of a building shall have lockable doors or gates created with temporary fencing for security during off-hours.

Except as amended here and in the “Scope of Work” Section, all other Sections of this exhibit shall be followed. No removal of sheetrock and joint compound wall and/or ceiling system materials shall be performed prior to the approval of the Owner’s agent/site representative.

Contractor Responsibilities

1. Except as amended here and in Section 24, Asbestos Specification/Procedures, all other Sections of this Specification shall be followed.

2. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

3. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition. HEPA equipment to be used inside any building must have been DOP tested within the last 90 days. This DOP certification must be verified by Owner’s agent/site representative prior to its use.

4. DOP certification testing shall be observed and witnessed by an Owner’s agent/site representative. Copies of DOP test results and certification must be submitted to Owner’s agent/site representative within 24 hours of the testing being performed.

5. All poly sheeting to be used for the construction of enclosures/containments must be fire retardant. SDS information reflecting this requirement must be submitted prior to use.

6. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials must possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

7. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of asbestos-containing material is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site. The Owner shall also be responsible for arming and disarming alarm systems on buildings where work will be performed.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups if available. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General Sheetrock and Joint Compound Wall and Ceiling Systems Removal Instructions and Requirements

1. For the purposes of this project, removal of sheetrock and joint compound wall and ceiling systems by any method shall be performed by personnel who are properly trained and accredited to perform Class II Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the containment area during actual removal work without proper respiratory and personal protective equipment. At a minimum, this shall include half-face negative pressure respirators, full body coveralls, rubber boots, and gloves. **No street clothes or shoes shall be worn inside containment during the removal process**.

3. All doors, windows, and penetrations into the room(s) shall be sealed with poly sheeting. All ventilation systems shall be locked-out and sealed with critical barriers of either poly sheeting or plywood sheeting.

4. Full enclosure of the walls and ceiling with poly sheeting (as applicable) will be required, no matter what method of removal is used. Support of ceiling poly will be at the discretion of the Contractor. Ceiling may be constructed of one layer of 4 mil poly sheeting. Walls shall be constructed of one layer of 6 mil poly.

5. Based on the size of the enclosure/containment, a three stage decontamination unit shall be put into place and be fully operable. The clean room of any three-stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height.

6. Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and -0.025" air pressure differential. A manometer with an accurate circular or equivalent recording chart must be installed and operational. The manometer chart(s) shall reflect the location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection

from Owner's agent/site representative.

7. When the Contractor has passed the pre-start visual inspection, removal of sheetrock and joint compound wall and ceiling systems may be conducted.

8. Sufficiently wet sheetrock and joint compound wall and ceiling systems to be removed with amended water prior to and during the removal phase of work, and place into waste containers for disposal. Acceptable methods of containing sheetrock and joint compound wall and ceiling system waste materials include placing waste into clear 6 mil poly bag and seal bag with appropriate amount of tape. This bag shall be cleaned of all visible dust and deposited into a second clear 6 mil poly bag and sealed with an appropriate amount of tape using the "goose neck" method. This second bag must then be labeled with the appropriate Cal/OSHA asbestos warning label.

9. Upon completing the removal of all sheetrock and joint compound wall and ceiling systems, the Contractor shall conduct wet wiping on all remaining surfaces within the containment/enclosure.

Final Visual Inspection

1. Upon the completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove/clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed. Any three dimensional debris identified by the Owner's agent/site representative, shall be removed as directed with the use of a HEPA vacuum and other tools as necessary to remove the material. The Contractor shall thoroughly clean all equipment inside the containment, including all parts of the negative air units, and new pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. The asbestos contractor may encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete.

Clearance Criteria

1. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the containment.

Disposal Requirements

1. All sheetrock and joint compound wall and ceiling system waste may be disposed as non-hazardous asbestos waste, in a landfill permitted to accept non-friable, non-hazardous asbestos containing material.

2. Waste material containers, including "burrito wrapped" material, shall have warning labels affixed. Contractor may either use the Cal/OSHA Title 8, 1529 (k)(8)(A-D) warning:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS

DO NOT BREATHE DUST
AVOID CREATING DUST

3. All non-hazardous asbestos containing waste shall be tracked utilizing some form of system which at a minimum includes: date, document number, generator name and mailing address, description of the waste, waste generating site address, contractor company name and address, special handling instructions, transporter company name, as well as name and address of facility accepting the waste.

Part 23.9 - Impact to and Removal of Transite Pipe, Shingle, or Sheeting Materials

Where transite pipe, shingles, or sheeting is to be impacted or removed the following procedures shall be performed:

1. All requirements of Cal/OSHA Section 1529 and US EPA AHERA regulations apply, and shall be followed, as well as, other applicable Federal, State, and local regulations as they pertain to training, work practices, air monitoring, waste disposal, etc.

2. Personal air monitoring shall be performed in accordance with Cal/OSHA Section 1529

3. Establishment of a work area restricting access to those personnel involved in the work, and posting of the work area is required.

4. An appropriately sized drop cloth of 6-10 mil poly sheeting sufficient in size to contain any debris generated during the removal shall be placed directly under the area to be worked to collect any fallen debris generated during the work.

5. Half-masks and disposable suits (at a minimum) shall be used during this work.

6. A HEPA vacuum must be in the immediate area ready for use.

7. Where the pipe must be cut the contractor may use any method applicable to performing the work. Any use of hand or mechanical saws, or other method which will produce dust and will require the use of the HEPA vacuum and engineering controls which will collect any and all dust generated during the sawing process.

8. The Contractor shall apply a sufficient amount of amended water to all pipe surfaces to be impacted during the work to keep them adequately wet.

9. All of the Contractor's materials, including poly sheeting, tools, etc. shall be properly decontaminated of visible dust and pipe debris utilizing wet cleaning methods and HEPA vacuuming prior to being removed at the completion of the work performed. Disposable materials must be properly disposed.

10. Transite waste generated may be disposed as non-hazardous asbestos waste, in a landfill permitted to accept non-friable, non-hazardous asbestos material. If the transite material is currently friable, or becomes friable during its removal, it shall be disposed of in a landfill permitted to accept friable asbestos waste.

    It is acceptable to dispose of non-friable transite waste after placing it into two 6 mil thick polyethylene bags properly sealed and marked to meet current OSHA requirements.

11. The Contractor is required to provide to Owner's Agent a copy of the "trip ticket" indicating the actual weight of waste material and the landfill accepting the waste.

Altadena Library
Part 23.10- Demolition with Selected Asbestos Containing Materials Left in Place

Under some circumstances, asbestos-containing materials may remain in or on a building during the building's demolition. This section describes the work practices and requirements for the demolition of a building with asbestos-containing materials remaining in place in or on the structure.

All friable, Category II non-friable materials, and all Category I non-friable materials that are expected to become friable during the demolition must be removed prior to the start of the demolition process. For example, surfacing materials, pipe wrap insulation, vinyl sheet flooring and associated backings, vinyl floor tiles and asbestos cement products must be removed from a building prior to its demolition. Should there be any question as to whether or not a material may remain in or on the building during the demolition, the Contractor shall ask for an opinion in writing from the Owner's agent/site representative. The determination of whether or not a material may remain in a building during the demolition is left solely to the determination of the Owner's agent/site representative.

The only asbestos-containing materials that may remain in or on a building during the building demolition include non-friable materials that the local Air Quality Management District or US EPA has determined may remain in or on the building during the demolition. Approval of this method is determined by the US EPA with the California Air Resources Board having jurisdiction in this county. In general, this will be limited to Category I non-friable materials such as roofing, rubber cove base and associated adhesives, paint, mastics, and other adhesives. In order to be considered for being left in or on the building during demolition, there must be a reasonable assumption that these materials will remain non-friable during the demolition.

The black floor mastic containing greater than 1% asbestos on the concrete may be left in place and demolished with the rest of the building as a non-hazardous asbestos waste, as long as, the materials do not become friable. The US EPA NESHAP has determined if this type of flooring mastic becomes friable during the course of the demolition, then it would be considered RACM. Removal of the concrete sections of floor containing the floor mastic using an excavator would not be considered a mechanical action that renders the floor mastic friable. Running over the concrete floor covered with the mastic using an excavator or other heavy equipment with metal tracks will render the concrete and mastic friable and shall not be allowed. The contractor can use an excavator or other heavy equipment with rubber tires on the concrete and is generally not considered to render the mastic friable. If a contractor uses a heavy equipment with metal track on this project, it will not be allowed to go onto the concrete floor that has black mastic, whether the concrete is covered with carpeting, linoleum, vinyl flooring, or other materials. All work will stop at the direction of Atlas if the contractor uses mechanical means that renders the asbestos containing materials left in place friable.

Should the building and materials meet the criteria listed above, the building may be demolished without the prior removal of those materials. However, if previously unidentified materials are discovered during the demolition process, the Contractor must stop demolition and notify the Owner's agent/site representative of the existence of the new material. Under no circumstances may the Contractor continue to disturb the new material until the new material has been properly investigated and the Contractor given permission to proceed by the Owner's agent/site representative.

The demolition of any building on this project with ACM, ACBM, or ACCM remaining in place must be conducted by a California licensed asbestos contractor with current and valid registration with the California Division of Occupational Safety and Health Asbestos Contractors' Registration Unit.

The Federal Occupational Safety and Health Administration (OSHA) has defined the demolition of buildings that contain Class II materials (non-friable materials) to be Class II work. Therefore the training, work practices, and procedures of Class II work must be followed. The following requirements summarize the requirements for Class II work as listed in the Asbestos Standard for the Construction Industry (Title 8 CCR 1529) for work such as demolition where specific controls have not been listed in the standard.

The supervisor must meet the training requirements for a "competent" person for Class II work as listed in Title 8 CCR 1529 (o)(4)(A). In summary, the supervisor must be an accredited supervisor as set for in the EPA's Model Accreditation Program (40 CFR Part 763, Subpart E). A Competent Person must be present

during the course of the asbestos related work. An AHERA accredited asbestos Contractor/Supervisor meets the training and definition of a Competent Person.

The workers must at a minimum meet the training requirements as listed in Title 8 CCR 1529 (8)(k)(9)(D). In summary, they must have a minimum of eight hours of training that includes the subjects listed in Title 8 CCR 1529 (k)(9)(H).

The following procedures must be followed:

1. The work shall be performed using wet methods. At a minimum, one worker must direct a water spray onto the portion of the building being demolished. The amount of water utilized must be adequate to prevent any release of visible dust into the air. The Contractor is responsible for controlling and channeling the flow of the waste water in a manner that meets local ordinances and regulatory agency requirements. The debris generated during the demolition process must be visually wet at all times prior to and while it is being containerized.

2. Effort should be made to remove the sections of asbestos-containing materials in as intact a condition as possible.

3. Debris must be containerized as described below. Debris must be containerized or kept wet during any work breaks. No loose debris may be left on the site overnight. Any building partially impacted by the work which will not be totally demolished by the end of the day must be completely wetted prior to the end of the shift.

4. Debris must be placed in a container that can be closed or sealed with poly sheeting. The container must have the inside lined with a minimum of two layers of reinforced ten millimeter thick poly sheeting with enough sheeting remaining on all sides to allow for burrito wrapping of the load. The two layers of poly sheeting must be independently closed and sealed with tape and spray glues. This wrapped material must then be labeled with the sign described in Title 8 CCR 1529 (k)(8) DANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD

5. Nonhazardous waste data forms for each container must be supplied to the Owner's agent/site representative no later than the end of each day.

6. Contractor shall provide personal air monitoring for Class II as described in Title 8 CCR 1529 (f)(3)(A).

7. The Contractor shall develop a regulated area that keeps unauthorized persons out of the work area.

8. All personnel in the regulated area must wear, at a minimum, disposable clothing and a half-face respirator with P-100 (HEPA) cartridges.

9. Regardless of any exposure monitoring, the Contractor will require all workers to wear at a minimum protective suits and half-face negative pressure respirators. This requirement does not relieve the Contractor of performing personal monitoring of its workers.

Part 23.11 - Contaminated Attic Space Procedures

The District considers all existing attic spaces throughout the District to be contaminated with asbestos containing roofing debris unless otherwise determined or reported. The District has restricted access to all attic spaces to properly trained and protected personnel. Excluded from this restriction is opening a ceiling access hatch and entering the attic space with the upper body. Physical access into an attic space which includes a person placing their entire body in the attic space with intent to access other areas of the attic space is prohibited by unprotected and untrained personnel. No entry into these spaces shall be made

regardless of duration of time or intent without compliance with the requirements outlined in this Part of the project specifications.

Activities expected to take place in contaminated attic spaces most closely resemble the definition of “Class IV” work which is defined by Cal/OSHA in CCR; Title 8, Section 1529, as maintenance and custodial activities during which employees contact but do not disturb asbestos containing material (ACM) or presumed asbestos containing material (PACM).

To comply with the various regulations pertaining to this type of work in contaminated attic spaces, the following procedures are to be followed by individuals entering these areas.

1. Personnel assigned to enter contaminated attic spaces shall receive a minimum of two hours of asbestos awareness training. This training must include the following:

   The possible health affects of asbestos exposure,
   the types of asbestos materials normally encountered in such spaces,
   the known and possible hazards that may be found in such spaces,
   the purpose and proper use of protective clothing,
   the proper selection, use, and limitations of respirators.

2. Personnel assigned to wear respirators must be included in a respirator protection program as outlined in California General Industry Safety Order 8 CCR 1544. All full body entry into an attic space with the intent to access the attic space will require use of at least a half-face negative pressure respirator with HEPA filters.

3. Prior to entry of a contaminated attic space each employee must pass a medical evaluation to ensure their fitness to wear a respirator.

4. A certified asbestos competent person must select the appropriate type of respirator(s) for the airborne asbestos levels anticipated to be encountered during such work.

5. Each employee assigned a respirator must successfully pass a qualitative or quantitative fit test prior to entry of a contaminated space.

6. A six (6) mil poly drop sheet must be placed at the entry to the space (approximately 6' X 6' in size) prior to entry.

7. Clean, potable water must be made available at the entry/exit for use to wash hands, faces, and equipment upon exiting from the space.

8. Employees entering contaminated attic spaces shall don two (2) sets of whole body coveralls, including head and foot covering. Appropriate type gloves for the work to be conducted must also be worn.

9. Disposal bags (6 mil poly), with the appropriate labeling, shall be made available at the entry/exit for disposal of contaminated protective clothing. One bag to be placed inside the space at the exit point and one shall be placed outside the space at the exit point.

10. Personnel working in contaminated attic spaces shall be instructed not to touch or disturb any suspect asbestos debris or materials encountered. If the extent of contamination is such that the employees can not perform their work without disturbing the material or debris, they shall exit the space until such time a certified asbestos abatement contractor has removed the material or debris and thoroughly encapsulated the area.

11. All tools or other equipment used in the course of the work shall be wiped down with clean, damp rags, prior to being removed from the space.

12. Prior to exiting the contaminated attic space, personnel shall remove their outer set of coveralls immediately adjacent to the exit point, leaving their respirator in place and dispose of the used coveralls in the waste bag.

13. Upon exiting the contaminated attic space, personnel shall remove the inner (or remaining) set of coveralls and place these in the waste bag provided for this purpose.

14. Personnel shall wash their hands prior to carefully removing their respirator and disposing of the filters in the waste bag provided.

15. Personnel shall at this time wash their faces and complete the decontamination of their respirators.

Part 23.12 - Non-Friable, Non-Hazardous, Glazing Abatement Requirements General Requirements

1. Removal of non-friable, non-hazardous, asbestos-containing glazing materials shall be coordinated and scheduled to be performed when there are favorable weather conditions, such as, low winds and no rain. If possible the work should be conducted when the interior space adjacent to the removal area is unoccupied.

2. Work should be halted if wind conditions occur which can or does cause removed glazing materials to be blown off the perimeter poly sheeting, or beyond the designated removal area perimeter.

3. No cutting, sanding, grinding, or removal by any other method which will result in the glazing being crumbled, crushed, or turned in to powder is to be used without review and approval by the Owner and the Owner's Representative.

General Glazing Removal Instructions and Requirements

1. Removal of non-friable, asbestos-containing, glazing materials, is designated as Class II work. Half-face, negative pressure respirators and disposable coveralls shall be used at a minimum by all workers, at all times, when within the regulated area.

2. All glazing materials shall be removed in an intact state to the extent feasible utilizing hand tools such as a hammer and chisel, or other implement or tool suitable for this type of work. At no time may power tools be used while following these removal requirements.

3. All glazing materials are to be pre-wet with an amended water solution or liquid encapsulant prior to removal, and as needed during removal.

4. All associated surfaces where removal of glazing has taken place shall be wet wiped and HEPA vacuumed prior to removal of the regulated area or any interior poly sheeting/critical barrier. Particular attention shall be directed at assuring all loose debris has been cleaned from the removal surfaces.

5. Upon completion of all activities worker shall clean exposed skin with hot soap and water, and check clothing for any glazing chips. Remove chips by hand or utilize a HEPA filter equipped vacuum.

Pre-Abatement Preparation Requirements

1. The worker may either seal the interior window surface with poly sheeting to create a critical barrier, or place one layer of 6 mill poly sheeting on the floor beneath the window incase a window pane is broken during removal. These critical barriers or floor coverings shall be installed prior to the initiation

of the removal work, and removed upon completion of the removal work as appropriate.

2. If the interior space must remain occupied a critical barrier must be installed on the interior surface of the window or opening where removal must occur. This may be waved and a layer of sheeting may be placed on the floor or adjacent surfaces if the interior space is going to remain unoccupied during the entire removal operation.

3. The perimeter of the work area where glazing removal is to be conducted, shall be posted with barrier tape at a distance of at least 20 feet from the edge of the removal area. This barrier tape will provide a buffer zone, and assist in the restriction of non-removal personnel.

4. Poly sheeting shall be placed on the ground directly below the work area or on adjacent surfaces for a distance sufficient to contain all debris which may be generated during the work. The poly sheeting should be secured to the ground using tape, weights, or other means to assure the poly will remain in place and not be picked up by wind or become a trip hazard.

Posting and Label Requirements for:

Regulated Area

Access to regulated areas shall be posted as outlined by Cal/OSHA Title 8, 1529 (k)(7)(B) 1 and 2 with warning signs and barrier tape bearing the following information:

DANGER ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE
REQUIRED IN THIS AREA

These postings are required to warn non-abatement personnel of the restricted access, and potential hazard which exists in the vicinity of the regulated area.

If an NEA indicates no respirators are required to be worn to perform the work, be sure to remove the requirement for “respirators and protective clothing”.

Work Area Perimeter

Work area perimeters shall be posted with barrier tape bearing one of the following descriptions:

CAUTION in black letters on a solid yellow background.
DANGER in black letters on a solid red background.
DANGER ASBESTOS HAZARD in black letters on a solid red background.

Waste Material Containers

Waste material containers, shall have warning labels affixed in accordance with Cal/OSHA Title 8, 1529 (k)(8)(A-D).

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

Waste Disposal

1. Glazing waste may be disposed as non-hazardous asbestos waste, in a landfill permitted to accept non-friable, non-hazardous asbestos-containing material as long as the removal work was performed by hand utilizing hand tools, and the materials were not crushed, pulverized, or turned into powder during the removal process. If this does occur the waste must be reclassified as friable. If the asbestos-containing glazing material is currently friable, or becomes friable during its removal, it shall be disposed of in a landfill permitted to accept friable, hazardous, asbestos waste.

Part 23.13 - Subfloor Crawl Space Dirt Removal Requirements General Requirements

Direction to remove loose surface dirt from throughout a subfloor space contaminated with friable asbestos containing material (ACM) or dust from friable ACM shall be performed within a full enclosure. All loose dirt shall be removed to as required such as “hard pack”, as defined in other Sections of the Project Documents, or determined by the Owner’s Representative in a specific “Scope of Work” to be performed related to this work.

Any full enclosure/containment constructed for removing loose surface dirt, shall include critical barriers at all vents, openings, penetrations, voids, etc., a sufficient number of DOP challenge tested negative air units to attain a level of at least -0.03" of negative air pressure within the subfloor containment space and a minimum of four (4) air changes an hour, a manometer with digital readout capabilities, and at a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. “Pop up” 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system. Documentation of this capability shall be provided to Owner’s agent/site representative.

Except as amended here and in the “Section 24”, all other Sections of this exhibit shall be followed which apply to creation of containments specifically or asbestos related work practices. No removal of dirt suspected of being contaminated with friable ACM or dust from friable ACM shall be performed prior to the Contractor receiving approval from the Owner’s agent/site representative.

Contractor Responsibilities

1. Except as amended here and in Section 24, Asbestos Specification/Procedures, all other Sections of this Specification shall be followed.

2. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

3. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition. HEPA equipment to be used on the project must be DOP challenge tested at the site. This DOP challenge test and certification process must be verified by Owner’s agent/site representative prior to its use.

4. DOP certification testing shall be observed and witnessed by an Owner's agent/site representative. Copies of DOP test results and certification must be submitted to Owner's agent/site representative within 24 hours of the testing being performed.

5. All poly sheeting to be used for the construction of enclosures/containments must be fire retardant. SDS information reflecting this requirement must be submitted prior to use.

6. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials must possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

7. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of ACM or dirt contaminated with ACM is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General Removal Instructions and Requirements

1. Prior to removal of loose dirt from the subfloor spaces all thermal system insulation TSI materials will be removed utilizing the procedures and work practices outlined in Section 23 of this Exhibit. Removal of loose dirt by any method shall be performed by personnel who are properly trained and accredited to perform Class I Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the subfloor containment area for any reason before or during actual removal work without proper respiratory and personal protective equipment. At a minimum this shall include half-face negative pressure respirators, full body coveralls, rubber boots, and gloves prior to starting dirt removal work, and full face powered air purifying respirators after dirt removal work has begun. **No street clothes or shoes shall be worn under full body coveralls or inside containment once removal of dirt begins regardless of amount of time to be spent in containment**.

3. All openings, doors, hatches, voids, penetrations, etc. into the contained space shall be sealed with poly sheeting. All HVAC ducts which may be present shall be wrapped with one layer of poly sheeting to prevent any dust being pulled into the duct system while work is being performed. **No spray glue may be used on any exterior surface of a building.**

4. Removal of loose dirt over a surface area greater than 25 square feet will require the construction and use of a three stage decontamination unit. This decontamination unit must be directly attached to the entrance to the subfloor space and fully operable with working shower and hot water heater, as well as properly stocked with towels, soap, and shampoo. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. "Pop up" 3' X 3' style

prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system.

5. Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and -0.03" air pressure differential. A manometer with an accurate circular, or equivalent recording chart must be installed and operational. The manometer chart(s) shall reflect the location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

6. When the Contractor has passed the pre-start visual inspection, removal of loose surface dirt may be conducted.

7. Sufficiently wet materials to be removed with amended water prior to and during the removal phase of work, and place into waste containers for disposal.

8. Upon completing removal of all loose surface dirt, the Contractor shall conduct wet wiping of all remaining wall and subfloor ceiling components to remove settled dust from those surfaces.

Industrial Vacuums

It is expected industrial type vacuum systems will be used to perform removal of loose dirt in subfloor spaces. Use of such equipment will require construction of an enclosure around the unit which will at a minimum enclose the hopper and bagging hose. This enclosure will be placed under negative pressure and also monitored with a manometer with digital readout capabilities. Bagging of waste is expected to be in containers appropriate for the amount of work being performed. All waste containers regardless of size or type of construction must be properly labeled.

Final Visual Inspection

1. Upon completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove any additional dirt and/or clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed. The Contractor shall thoroughly clean all equipment inside the containment, including all parts of the negative air units exposed to the subfloor. New pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. The asbestos contractor shall encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete. Lock down of the subfloor will be performed using an acceptable bridging encapsulant. To assure complete coverage of the subfloor interior surfaces to include all ceiling, wall and dirt floors will require the contractor add a color to the encapsulant which will be visibly different in color than the colors generally found within a subfloor space. This color will be used to assure prior to conducting clearance air monitoring within the subfloor that all surfaces have been locked down and no loose dust on building surfaces remain.

Clearance Criteria

1. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the

AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the subfloor containment. Leaf blower and fans will not be directed at remaining dirt surfaces but toward building components.

Disposal Requirements

1. All dirt waste shall be disposed as hazardous asbestos waste, in a landfill permitted to accept friable, hazardous ACM.

2. All waste containers shall have stick-on labels as per OSHA and Cal/EPA requirements. All waste containers shall be labeled in accordance with Cal/EPA regulations that require a "Caution" label and a "Hazardous Waste" label with the generator's name, address, and Manifest Document number.

3. If bulk loading of waste into “burrito wrap” style bags is to be performed contractor is responsible for assuring the waste facility is aware of this type of bagging and will accept the waste upon its arrival. Bulk loading of dirt waste into large “burrito wrap” style containers will result in heavy stresses upon the poly sheeting. Contractor must submit written directions indicating the requirements to be used to create such waste containers. Contractor may not use these container bags until approved by Owner’s Representative.

Part 23.14 - Subfloor Enclosure Requirements

Creation of enclosures within a contaminated subfloor space will be necessary in anticipation of other trades performing work in specific areas, which will not require impact to the dirt floor of the space. These other trades will need to have access to these enclosures without the need for respirators, full body coveralls, gloves, and asbestos related training. As a result the enclosure must be sturdy and remain in place until all other trade work has been completed.

It is expected the subfloor enclosure will be accessed from within the building. Contractor will construct the enclosure by also accessing the space to be enclosed from within the building. As a result, the contractor shall be required to construct a two-stage decontamination unit in place over any subfloor access hatch. This decontamination unit will be used to protect the building’s interior spaces from being contaminated by dust from the subfloor space. Contractor shall also provide a DOP challenge tested, HEPA equipped, pressure differential unit to provide negative airflow into the decontamination unit. The unit shall be attached to the decontamination unit opposite the entrance to assure air is pulled into the decontamination unit. All exhaust from this unit shall be exhausted to the building’s exterior. The unit shall remain on continuously until final air clearance has been achieved.

General Removal Instructions and Requirements

1. Enclosure walls and floors must be constructed of at least one layer of fire-rated, 10 mil re-enforced poly sheeting. This poly sheeting shall cover the dirt floor surface and extend from the floor surface to the underside of the subfloor ceiling.

2. Enclosure walls shall be installed at a minimum of 5' beyond the edge of any work to be performed to allow for adequate workspace by other trades.

3. Poly sheeting shall be secured to the underside of the subfloor ceiling in a manner sufficient to provide maximum strength to reduce possible breaching of the wall systems while regular work is being performed. Contractor may use any appropriate method deemed necessary to accomplish this goal to include fasteners, staples, fur strips, tape, etc. Tape alone will not be acceptable to accomplish this goal.

4. Poly sheeting shall be secured at corners and along walls at floor level in a manner to keep the containment from being pulled in or collapsing into the work space being provided. Contractor shall fasten the walls and floor of the enclosure at sufficient points to prevent this from occurring.

5. Poly sheeting shall be sealed at all points necessary to make the barrier system air tight regarding the walls and floor to keep the containment from becoming contaminated from air within the remaining subfloor space.

6. Upon completing construction of the enclosure the contractor shall wet wipe and clean all enclosed surfaces to include poly walls, poly floors, ceiling components, and any other surfaces which may remain within the enclosure system. If any thermal system insulation is located within, the enclosure contractor must repair any damages, clean all surfaces, and apply appropriate labels to the material to assure it is properly identified as asbestos. If the materials are to be removed, they shall be removed by glove bag technique only.

7. Upon completion of wet cleaning of the enclosure interior the Owner's Representative shall perform a final visual inspection for completeness of cleaning.

8. Upon acceptance of the containment as clean, the contractor shall encapsulate the enclosure interior surfaces with an acceptable encapsulant.

9. Owner's representative shall perform final clearance air monitoring upon completion of all tasks related to the construction of the enclosure and prior to allowing other trades access to the enclosure. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the subfloor containment. Leaf blower and fans will not be directed at remaining dirt surfaces but toward building components.

Part 23.15 - Subfloor Space Pony Wall Installation, Dirt Removal Requirements General Requirements

Direction to remove loose surface dirt from throughout a subfloor space contaminated with friable asbestos containing material (ACM) or dust from friable ACM shall be performed within a full enclosure. All loose dirt shall be removed to as required such as "hard pack", as defined in other Sections of the Project Documents, or determined by the Owner's Representative in a specific "Scope of Work" to be performed related to this work.

Any full enclosure/containment constructed for removing loose surface dirt, shall include critical barriers at all vents, openings, penetrations, voids, etc., a sufficient number of DOP challenge tested negative air units to attain a level of at least -0.025" of negative air pressure within the subfloor containment space and a minimum of four (4) air changes an hour, a manometer with digital readout capabilities, and at a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. "Pop up" 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system. Documentation of this capability shall be provided to Owner's agent/site representative.

Except as amended here and in the "Section 24", all other Sections of this exhibit shall be followed which apply to creation of containments specifically or asbestos related work practices. No removal of dirt suspected of being contaminated with friable ACM or dust from friable ACM shall be performed prior to the Contractor receiving approval from the Owner's agent/site representative.

Altadena Library

Contractor Responsibilities

1. Except as amended here and in Section 24, Asbestos Specification/Procedures, all other Sections of this Specification shall be followed.

2. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

3. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition. HEPA equipment to be used on the project must be DOP challenge tested at the site. This DOP challenge test and certification process must be verified by Owner's agent/site representative prior to its use.

4. DOP certification testing shall be observed and witnessed by an Owner's agent/site representative. Copies of DOP test results and certification must be submitted to Owner's agent/site representative within 24 hours of the testing being performed.

5. All poly sheeting to be used for the construction of pony walls to create enclosures/containments must be 10 mils thick, re-enforced, and fire retardant. SDS information reflecting this requirement must be submitted prior to use.

6. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials must possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

7. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of ACM or dirt contaminated with ACM is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups if available. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General Removal Instructions and Requirements

1. Prior to removal of loose dirt from the subfloor spaces all thermal system insulation TSI materials will be removed utilizing the procedures and work practices outlined in Section 23 of this Exhibit. Removal of loose dirt by any method shall be performed by personnel who are properly trained and accredited to perform Class I Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the subfloor containment area for any reason before or during actual removal work without proper respiratory and personal protective equipment. At a minimum this shall include half-face negative pressure respirators, full body coveralls, rubber boots, and gloves prior to

starting dirt removal work, and full face powered air purifying respirators after dirt removal work has begun. **No street clothes or shoes shall be worn under full body coveralls or inside containment once removal of dirt begins regardless of amount of time to be spent in containment**.

3. All openings, doors, hatches, voids, penetrations, etc. into the contained space shall be sealed with poly sheeting. All HVAC ducts, which may be present, shall be wrapped with one layer of poly sheeting to prevent any dust being pulled into the duct system while work is being performed. **No spray glue may be used on any exterior surface of a building.**

4. Removal of loose dirt over a surface area greater than 25 square feet will require the construction and use of a three-stage decontamination unit. This decontamination unit must be directly attached to the entrance to the subfloor space and fully operable with working shower and hot water heater, as well as properly stocked with towels, soap, and shampoo. The clean room of any three-stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. "Pop up" 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0-micron particle size collection capability prior to release of the water into the treated water system.

   When less than 25 square feet of surface area and less than 25 linear feet of thermal system insulation is to be removed, refer to "Subfloor Enclosure Requirements".

5. Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and -0.03" air pressure differential. A manometer with an accurate circular or equivalent recording chart must be installed and operational. The manometer chart(s) shall reflect the location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

6. When the Contractor has passed the pre-start visual inspection, removal of loose surface dirt may be conducted.

7. Sufficiently wet materials to be removed with amended water prior to and during the removal phase of work, and place into waste containers for disposal.

8. Upon completing removal of all loose surface dirt, the Contractor shall conduct wet wiping of all remaining wall and subfloor ceiling components to remove settled dust from those surfaces.

Industrial Vacuums

It is expected industrial type vacuum systems will be used to perform removal of loose dirt in subfloor spaces. Use of such equipment will require construction of an enclosure around the unit, which will at a minimum enclose the hopper and bagging hose. This enclosure will be placed under negative pressure and also monitored with a manometer with digital readout capabilities. Bagging of waste is expected to be in containers appropriate for the amount of work being performed. All waste containers regardless of size or type of construction must be properly labeled.

Final Visual Inspection

1. Upon completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove any additional dirt and/or clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed. The Contractor shall thoroughly clean

all equipment inside the containment, including all parts of the negative air units exposed to the subfloor. New pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. The asbestos contractor shall encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete. Lock down of the subfloor will be performed using an acceptable bridging encapsulant. To assure complete coverage of the subfloor interior surfaces to include all ceiling, wall and dirt floors will require the contractor add a color to the encapsulant, which will be visibly different in color than the colors generally found within a subfloor space. This color will be used to assure prior to conducting clearance air monitoring within the subfloor that all surfaces have been locked down and no loose dust on building surfaces remain.

Clearance Criteria

1. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the subfloor containment. Leaf blower and fans will not be directed at remaining dirt surfaces but toward building components.

Disposal Requirements

1. All dirt waste shall be disposed as hazardous asbestos waste, in a landfill permitted to accept friable, hazardous ACM.

2. All waste containers shall have stick-on labels as per OSHA and Cal/EPA requirements. All waste containers shall be labeled in accordance with Cal/EPA regulations that require a "Caution" label and a "Hazardous Waste" label with the generator's name, address, and Manifest Document number.

3. If bulk loading of waste into "burrito wrap" style bags is to be performed contractor is responsible for assuring the waste facility is aware of this type of bagging and will accept the waste upon its arrival. Bulk loading of dirt waste into large "burrito wrap" style containers will result in heavy stresses upon the poly sheeting. Contractor must submit written directions indicating the requirements to be used to create such waste containers. Contractor may not use these container bags until approved by Owner's Representative.

Part 23.16 - Installation of "Rat Slab" in Sublfoor Crawl Space Requirements General Requirements

No direction relating to actual installation of "Rat Slab" materials is included here. This information is related to additional requirements for the work to be performed within a subfloor space known or assumed to be contaminated with asbestos.

Prior to installation of "Rat Slab" materials within a subfloor contaminated with asbestos the subfloor must be properly sealed and placed under negative pressure. Removal of all remaining thermal system insulation (TSI) or other friable asbestos containing material (ACM) must be performed prior to the installation of the "Rat Slab" materials.

Any full enclosure/containment constructed for the purpose of installing a "Rat Slab" will require installation of critical barriers at all vents, openings, penetrations, voids, etc., a sufficient number of DOP challenge tested negative air units to attain a level of at least -0.03" of negative air pressure within the subfloor containment

space and a minimum of four (4) air changes an hour, a manometer with digital readout capabilities, and at a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. “Pop up” 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system. Documentation of this capability shall be provided to Owner’s agent/site representative.

Except as amended here and in the “Section 24”, all other Sections of this exhibit shall be followed which apply to creation of containments specifically or asbestos related work practices. No removal of TSI, visible TSI debris or associated dirt suspected of being contaminated with friable ACM or dust from friable ACM shall be performed prior to the Contractor receiving approval from the Owner’s agent/site representative.

Contractor Responsibilities

1. Except as amended here and in Section 24, Asbestos Specification/Procedures, all other Sections of this Specification shall be followed.

2. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

3. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition. HEPA equipment to be used on the project must be DOP challenge tested at the site. This DOP challenge test and certification process must be verified by Owner’s agent/site representative prior to its use.

4. DOP certification testing shall be observed and witnessed by an Owner’s agent/site representative. Copies of DOP test results and certification must be submitted to Owner’s agent/site representative within 24 hours of the testing being performed.

5. All poly sheeting to be used for the construction of pony walls to create enclosures/containments must be 10 mils thick, re-enforced, and fire retardant. SDS information reflecting this requirement must be submitted prior to use.

6. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials must possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

7. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of ACM or dirt contaminated with ACM is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups. However, the Contractor is responsible for all connections, electrical cords, GFCI’s, water hoses, and hose bibs necessary for attachment. GFCI’s are required to be used by the Contractor on all electrical circuits in use.

Altadena Library

General Removal Instructions and Requirements

1. All TSI materials will be removed utilizing the procedures and work practices outlined in Section 23 of this Exhibit. Removal of TSI or loose dirt contaminated with TSI debris by any method shall be performed by personnel who are properly trained and accredited to perform Class I Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the subfloor containment area for any reason before or during actual removal work without proper respiratory and personal protective equipment. At a minimum this shall include half-face negative pressure respirators, full body coveralls, rubber boots, and gloves prior to starting dirt removal work, and full face powered air purifying respirators after dirt removal work has begun. **No street clothes or shoes shall be worn under full body coveralls or inside containment once removal of dirt begins regardless of amount of time to be spent in containment**.

3. All openings, doors, hatches, voids, penetrations, etc. into the contained space shall be sealed with poly sheeting. All HVAC ducts which may be present shall be wrapped with one layer of poly sheeting to prevent any dust being pulled into the duct system while work is being performed. **No spray glue may be used on any exterior surface of a building.**

4. Removal of TSI in excess of 25 linear feet or TSI contaminated loose dirt over a surface area greater than 25 square feet will require the construction and use of a three-stage decontamination unit. This decontamination unit must be directly attached to the entrance to the subfloor space and fully operable with working shower and hot water heater, as well as properly stocked with towels, soap, and shampoo. The clean room of any three-stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. "Pop up" 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system.

   When less than 25 square feet of surface area and less than 25 linear feet of thermal system insulation is to be removed, refer to "Subfloor Enclosure Requirements".

5. Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and -0.03" air pressure differential. A manometer with an accurate circular or equivalent recording chart must be installed and operational. The manometer chart(s) shall reflect the location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

6. When the Contractor has passed the pre-start visual inspection, removal of TSI and TSI contaminated loose surface dirt may be conducted.

7. Sufficiently wet materials to be removed with amended water prior to and during the removal phase of work, and place into waste containers for disposal.

8. Upon completing removal of all TSI and TSI contaminated loose surface dirt the Owner's Representative will conduct a final visual inspection to verify this task has been satisfactorily completed.

Industrial Vacuums

If industrial type vacuum systems will be used to perform removal of loose dirt in subfloor spaces use of such equipment will require construction of an enclosure around the unit, which will at a minimum enclose the hopper and bagging hose. This enclosure will be placed under negative pressure and also monitored with

a manometer with digital readout capabilities. Bagging of waste is expected to be in containers appropriate for the amount of work being performed. All waste containers regardless of size or type of construction must be properly labeled.

"Rat Slab" Installation

The following items shall be required during "Rat Slab" installation activities:

1. Contractor will maintain 0.03" of negative pressure at all times during installation of "Rat Slab" materials.

2. Three stage decontamination unit with functional shower and all other requirements shall remain in place and be used by all personnel who must enter the subfloor space during installation of "Rat Slab" materials.

3. All personnel shall wear at a minimum half-face negative pressure respirators while inside the subfloor containment space.

4. All personnel shall at a minimum have Hazard Communication" training relating to asbestos as required by OSHA and in compliance with all OSHA requirements.

5. All personnel shall wear full body coveralls, appropriate work boots and appropriate work gloves while inside the subfloor containment space.

6. All personnel shall enter and egress through the three stage decontamination unit and take a full body shower prior to exiting the containment area.

7. All tools shall be properly cleaned of visible dust and dirt prior to removal from the subfloor containment space.

8. Upon completion of "Rat Slab" installation, contractor shall complete final cleaning of all visible dust from underside of ceiling and other surfaces within the subfloor containment.

Final Visual Inspection

1. Upon completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove any additional dirt and/or clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed. The Contractor shall thoroughly clean all equipment inside the containment, including all parts of the negative air units exposed to the subfloor. New pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. The asbestos contractor shall encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete. Lock down of the subfloor will be performed using an acceptable encapsulant. To assure complete coverage of the subfloor interior surfaces to include all ceiling, wall and "Rat Slab" surfaces will require the contractor add a color to the encapsulant which will be visibly different in color than the colors generally found within a subfloor space and the "Rat Slab". This color will be used to assure prior to conducting clearance air monitoring within the subfloor that all surfaces have been locked down and no loose dust on building surfaces remain.

Altadena Library

Clearance Criteria

1. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the subfloor containment. Leaf blower and fans will not be directed at remaining dirt surfaces but toward building components.

Disposal Requirements

1. All dirt waste shall be disposed as hazardous asbestos waste, in a landfill permitted to accept friable, hazardous ACM.

2. All waste containers shall have stick-on labels as per OSHA and Cal/EPA requirements. All waste containers shall be labeled in accordance with Cal/EPA regulations that require a "Caution" label and a "Hazardous Waste" label with the generator's name, address, and Manifest Document number.

3. If bulk loading of waste into “burrito wrap” style bags is to be performed contractor is responsible for assuring the waste facility is aware of this type of bagging and will accept the waste upon its arrival. Bulk loading of dirt waste into large “burrito wrap” style containers will result in heavy stresses upon the poly sheeting. Contractor must submit written directions indicating the requirements to be used to create such waste containers. Contractor may not use these container bags until approved by Owner’s Representative.

Part 23.17 - Stucco/Texture Removal and Containment Requirements General Requirements

Direction to remove major areas of stucco/texture surfacing materials regardless of asbestos content from exterior building components either by hand or by forced air methods shall be performed within a full enclosure. Extent of removal concerning stucco/texture surfacing materials is not included in this Part. That information shall be provided by others in appropriate project documents.

Any full enclosure/containment constructed for removing stucco/texture surfacing materials either by hand or by forced air methods shall include critical barriers at all vents, openings, penetrations, voids, etc. into the building, a sufficient number of DOP challenge tested negative air units to attain a level of at least -0.03" of negative air pressure within the containment space and a minimum of four (4) air changes an hour, a manometer with digital readout capabilities, and at a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. “Pop up” 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system. Documentation of this capability shall be provided to Owner’s agent/site representative.

Except as amended here and in the “Section 24”, all other Sections of this Exhibit shall be followed which apply to creation of containments specifically for asbestos related work practices. No removal of stucco/ texture surfacing materials shall be performed prior to the Contractor receiving approval from the Owner’s agent/site representative.

Contractor Responsibilities

1. Except as amended here and in Section 24, Asbestos Specification/Procedures, all other Sections of this Exhibit shall be followed.

2. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

3. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition. HEPA equipment to be used on the project must be DOP challenge tested at the site. This DOP challenge test and certification process must be verified by Owner's agent/site representative prior to its use.

4. DOP certification testing shall be observed and witnessed by an Owner's agent/site representative. Copies of DOP test results and certification must be submitted to Owner's agent/site representative within 24 hours of the testing being performed.

5. All poly sheeting to be used for the construction of enclosures/containments must be fire retardant. SDS information reflecting this requirement must be submitted prior to use.

6. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials must possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

7. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of asbestos containing stucco/texture is conducted. The Contractor shall also be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity. It is the responsibility of the Contractor to identify with the General Contractor all aspects of the project requirements pertaining to these types of damages.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups if available. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General Removal Instructions and Requirements

1. Removal of stucco/texture by any method and regardless of asbestos content shall be performed by personnel who are properly trained and accredited to perform Class I Work in public buildings, and are currently approved to conduct work on the project.

2. No personnel are allowed into the containment area for any reason during actual removal work without proper respiratory and personal protective equipment. At a minimum this shall include half-face negative pressure respirator if only hand scrapping is being performed. At a minimum this shall include full-face PAPR if air blasting methods are being employed. Regardless of the method used, full body coveralls, rubber boots, and gloves shall always be required while inside the containment. **No street clothes or shoes shall be worn by workers under full body coveralls or inside containment once removal has begun**.

3. All openings, doors, hatches, voids, penetrations, etc. which may lead into the building shall be sealed with poly sheeting. **No spray glue may be used on any exterior surface of a building.**

4. Removal of stucco/texture regardless of asbestos content over a surface area greater than 25 square feet will require the construction and use of a three stage decontamination unit. This decontamination unit must be directly attached to the entrance of the containment and fully operable with working shower and hot water heater, as well as properly stocked with towels, soap, and shampoo. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 8' in height. "Pop up" 3' X 3' style prefabricated units will not be allowed for this work. The filtration system must have at least a 1.0 micron particle size collection capability prior to release of the water into the treated water system.

5. Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and -0.03" air pressure differential. A manometer with digital readout capability must be installed and operational. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

6. When the Contractor has passed the pre-start visual inspection, removal of stucco/texture may be conducted.

7. Sufficiently wet materials to be removed with amended water prior to and during the removal phase of work, and place into waste containers for disposal.

8. Upon completing removal of all stucco/texture, the Contractor shall conduct wet wiping of all remaining wall surfaces, poly barriers, scaffolding, etc. to remove settled dust from those surfaces.

Final Visual Inspection

1. Upon completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's agent/site representative, and shall be present during the inspection by Owner's agent/site representative to remove any additional dirt and/or clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed. The Contractor shall thoroughly clean all equipment inside the containment, including all parts of the negative air units exposed to the work performed. New pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. Lock down-encapsulation of the containment shall be performed using one of two methods based on the needs of the project.

   A. **Hand Wipe Method:** The needs of the project may require the remaining building component surfaces have no new film materials applied to them. If this is required the asbestos abatement contractor shall use clean wet cloths/towels to wipe existing surface dust off of remaining building components. These cloths/towels will be wetted with clean water and no chemicals or treatments will be added. All poly sheeting scaffolding and other components used to create the containment will be hand wiped with wetted cloths/towels which are treated with lock down-encapsulation chemicals to remove possible surface dust and lock down-encapsulate the surfaces of these items. This method can be used prior to the final visual to complete the final cleaning process.

   B. **Aerial Dispersal Method**: The asbestos contractor shall lock down-encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete.

Altadena Library

Clearance Criteria (If Required)

1. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the containment.

Disposal Requirements

1. All waste containing less than 1% asbestos shall be properly disposed as a non-hazardous asbestos containing waste at an appropriate landfill. All waste containing greater than 1% asbestos shall be properly disposed as hazardous asbestos waste, in a landfill permitted to accept friable, hazardous ACM.

2. All waste containers shall have labeling in accordance with OSHA, DOT, EPA and DTSC requirements. All "Hazardous Waste" shall also include a Waste manifest with the generator's name, address, and Manifest Document number.

3. If bulk loading of waste into “burrito wrap” style bags is to be performed contractor is responsible for assuring the waste facility is aware of this type of bagging and will accept the waste upon its arrival. Bulk loading of waste into large “burrito wrap” style containers will result in heavy stresses upon the poly sheeting. Contractor must submit written directions indicating the requirements to be used to create such waste containers. Contractor may not use these container bags until approved by Owner’s Representative.

Part 23.18 - Fireproofing Abatement Requirements General Requirements

All fireproofing material regardless of amount shall be removed in a negative pressure enclosure/containment. The enclosure shall include critical barriers, two layers of plastic on walls if the walls are not being removed, a sufficient number of DOP tested negative air units to attain a level of at least -0.030" of negative air pressure within the containment, a digital recording manometer with a minimum of displaying three digits after the zero (0.000). At a minimum, a three-stage decontamination unit with an operational shower and water filtration system. The clean room of any three stage decontamination unit must be at least 5' in width, 8' in length, and 7' in height. The water filtration system must have at least a 1.0 micron particle size collection capability. Documentation of this capability shall be provided to Owner’s agent/site representative.

When possible, the Contractor shall enclose multiple rooms within a building into a single containment. Where rooms are joined by a common interior hallway or have a common exterior walkway, multiple spaces shall be joined together creating one containment using poly enclosures. The common work chamber shall be constructed of metal or wood studs and plywood sheeting for security purposes if outside of a building. Decontamination units and joined “common areas” outside of a building shall have lockable doors or gates created with temporary fencing for security during off-hours.

Contractor Responsibilities

1. Except as amended here and in Section 24, Asbestos Specification/Procedures, all other Sections of this Specification shall be followed.

2. The Contractor shall provide all necessary notifications, equipment, tools, materials, lighting, labor, etc. to perform the work. Notification as appropriate to OSHA, EPA, or the delegated Air Quality Management District is the responsibility of the Contractor.

3. All HEPA equipment to be used on the project must be delivered to the site empty of all debris, clean, free of dust, and in full operating condition.

4. DOP certification testing shall be observed and witnessed by the Owner's asbestos consultant. Copies of DOP test results and certification shall be submitted to Owner's agent/site representative within 24 hours of the testing being performed.

5. All poly sheeting to be used for the construction of enclosures/containments shall be fire rated. SDS information reflecting this requirement shall be submitted prior to use.

6. All personnel used by the Contractor to conduct removal or handling of asbestos-containing waste materials shall possess a current accreditation certificate as a worker or contractor/supervisor as described in 40 CFR Part 763, Appendix C to subpart E, Asbestos Model Accreditation Plan.

7. The Contractor shall be responsible for all clean-up and costs associated with the decontamination of occupied spaces adjacent to any containment where removal of asbestos-containing material is conducted. The Contractor will be responsible for damage to building finishes and costs associated with removal of tape glue, staining of wall finishes, or destruction of wall surface integrity.

Owner Responsibilities

1. The Owner shall provide the Contractor with access to the building during scheduled work hours through their representative. This representative is expected to be the General Contractor in charge of the site. The Owner shall also be responsible for arming and disarming alarm systems on buildings where work will be performed.

2. The Owner shall also provide the Contractor access to water and electrical hook-ups if available. However, the Contractor is responsible for all connections, electrical cords, GFCI's, water hoses, and hose bibs necessary for attachment. GFCI's are required to be used by the Contractor on all electrical circuits in use.

General Requirements

1. Removal of fireproofing by multiple methods and techniques shall be performed by personnel who are trained and accredited to perform Class I work in public buildings, and are currently approved to conduct work on the project.

2. Water blasting of fireproofing is not allowed on this project.

3. No personnel are allowed into the containment area during actual removal work without proper respiratory and personal protective equipment. At a minimum this shall include half-face negative pressure respirators, full body coveralls, rubber boots, and gloves.

4. All doors, windows, and penetrations into the room(s) shall be sealed with poly sheeting. All ventilation systems shall be locked-out and sealed with critical barriers of either poly sheeting or plywood sheeting.

5. Full enclosure of the walls and ceiling with poly sheeting (as applicable) will be required, no matter what method of removal is used. Support of ceiling poly will be at the discretion of the Contractor. Ceiling may be constructed of one layer of 4 mil poly sheeting. Walls shall be constructed of two layers of 4 mil poly.

6. A three-stage decontamination unit is required and shall be comprised of zippered doors between the chambers. Flapped doors will not be acceptable. The decontamination unit shall be cleaned daily of all debris, bags, tape, towels, etc. and shall remain clean during the day. The clean room of any three

stage decontamination unit shall be at least 5' in width, 8' in length, and 7' in height. Multiple showers are required if the number of asbestos workers exceeds ten per Title 8 3366 Washing Facilities. When there are less than five employees, the same shower may be used by both sexes if the shower room can be locked from the inside.

7. Since all asbestos workers will be required to shower upon leaving the work area, all workers shall wear a bathing suit under the full body coverall. The shower shall have hot and cold water, shampoo, soap and clean dry towels for drying. **No street clothes or shoes shall be worn inside containment by the asbestos contractor employees during the removal process**. The contractor cannot wear leatherwork boots in the shower, so steel toed rubber boots are required to be worn. Rubber boots shall be left in the equipment room before entering the shower and they can be washed at the end of the work day and placed inside of asbestos waste bag, taped closed and removed.

8. Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and a minimum of -0.030" air pressure differential, while the zippered doors are opened for bag-out of waste. A digital manometer recording shall be made of all days when in use. The manometer tapes shall reflect the location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner's agent/site representative.

9. When the Contractor has passed the pre-start visual inspection by the asbestos consultant, removal of fireproofing may be conducted.

10. Sufficiently wet fireproofing to be removed with amended water prior to and during the removal phase of work, and place into waste containers for disposal. Acceptable methods of containing the waste material include placing waste into a 6 mil poly bag and seal the bag using tape. This bag shall be moved to the waste load out shower, cleaned of all visible dust and deposited into a second 6 mil poly bag and sealed with tape using the "goose neck" method. This second bag must then be labeled with the appropriate asbestos warning labels for the regulated asbestos containing material (RACM). It is acceptable to have the waste manifest information placed inside of the second bag between the two bags as long as the writing on the waste manifest information can be read.

11. No fireproofing shall be allowed to remain on the floor of the containment at the end of each work shift. All fireproofing removed on a shift shall be placed in waste containers. During asbestos removal, all floors of the containment shall remain wet by frequent wetting with amended water. At no time shall the floor of the containment be dry.

12. The contractor shall clean all surfaces of the substrate using whatever tools to effectively clean and remove the material. On metal fluted decks where fireproofing material is removed, all fluted openings shall be cleaned of debris using small tools rags, brushes, etc. as necessary to reach the remove the material. Upon completing the removal of all fireproofing, the Contractor shall conduct wet wiping on all remaining surfaces within the containment/enclosure. Use of an airless spray to detail clean the fluted openings is an acceptable cleaning technique.

Final Visual Inspection

1. Upon the completion of all activities listed above, the asbestos contractor shall provide their own visual inspection prior to Owner's asbestos consultant shall be present during the inspection by Owner's asbestos consultant to remove/clean additional surfaces as needed, prior to encapsulation.

2. The final visual inspection will include an evaluation of all surfaces within the containment area, with emphasis placed on the completeness of materials removed. Any three dimensional debris identified by the Owner's asbestos consultant, shall be removed as directed with the use of a HEPA vacuum and other tools as necessary to remove the material. The Contractor shall thoroughly clean all

equipment inside the containment, including all parts of the negative air units, and new pre-filters shall be installed into all negative air units.

Final Lockdown-Encapsulation

1. The asbestos contractor may encapsulate the entire containment area upon completion of the final visual inspection by the Owner's agent/site representative, and acceptance of the work as complete.

Clearance Criteria

a. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the containment.

Disposal Requirements

1. All fireproofing waste shall be disposed as friable hazardous asbestos waste at a landfill permitted to accept friable, hazardous asbestos containing material.

SECTION 24. ASBESTOS SPECIFICATIONS/PROCEDURES

Part 24.1 - Contacts

Matt Reilly, Atlas Technical Consultants, 925-344-1872

Part 24.2 - Removal Locations

Refer to architectural drawings for this site identifying the buildings and work included in the project and scope of work outline. The General Contractor and his Sub-contractor are responsible for estimating the amount of asbestos-containing materials to be disturbed or removed as revealed on the mandatory bid walk, and provided in the project specifications and architectural drawings. The drawings will also provide the Contractor with locations where work is to be performed to allow computation of the quantities of materials to be impacted or removed.

The asbestos contractor shall provide a complete copy of this specification to their onsite competent person for reference while conducts work on the project. A copy of these specifications shall remain onsite by the asbestos contractor for the duration of the project.

Part 24.3 - Materials to be Abated

Refer to the architectural drawings and project specifications for designations and instructions pertaining to what materials are to be removed or impacted during this project. Directions pertaining to materials to be impacted or removed during this project are NOT included in this Exhibit. This exhibit includes work practices and procedures for those materials that are impacted by the planned renovation/demolition.

Areas of roofs, walls, floors, and/or ceilings may require penetrations be made during the project which may involve asbestos containing materials (ACM) depending upon the location of penetrations. Prior to impacting any building materials which are listed as "suspect" for containing asbestos by the US EPA the Contractor should refer to Section 25, Asbestos Results List for information pertaining to specific Asbestos Containing Materials (ACM) or products known to exist on the site. Materials suspected of containing asbestos but which have not been tested are "assumed" to contain asbestos.

A hazardous materials inspection was conducted by Atlas Technical Consultants for the Altadena Main Library, in preparation of this project. The contractor shall refer to the Hazardous Materials Survey report prepared on October 15, 2021 which includes all suspect building materials that were sampled and analyzed

for asbestos and included an assessment for lead in paint and ceramic products.

Materials commonly excluded from being suspected for containing asbestos include but are not limited to: unwrapped pink and yellow fiberglass insulating materials or products, foam insulation, wood, metal, plastic, or glass. All other types of building materials or coatings on the materials listed above are commonly listed as “suspect” and must be tested prior to impact by a Contractor.

Attic spaces at this site may already be contaminated with asbestos roofing debris from prior roofing replacement projects, but is unknown. If ceiling systems are removed and it is discovered that suspect roofing debris is present, the contractor shall stop work and bring it to the attention of the project manager to assess the potential for asbestos.

Any instruction in the project specifications or architectural drawings designating the removal of VFT shall include the removal of the associated floor tile adhesive/mastic and base cove mastic as well. Both of these materials must be assumed to contain asbestos unless reported otherwise in Section 25 of this Exhibit.

Part 24.4 - Containment and Abatement Requirements

The general guidelines in these specifications shall be followed by the asbestos abatement contractor for all work on this project. All requirements of Cal/OSHA Section 1529 and US EPA AHERA regulations apply, and shall be followed, as well as, other applicable regulations.

The Contractor shall follow all requirements set forth in Section 23, Specific Procedures and Requirements when disturbing or removing specific asbestos containing materials.

All asbestos related work shall be performed within negative pressure work enclosures for any class of asbestos work. The term “containment” or “enclosure” shall be construed to mean a containment which is constructed to enclose a work area (as defined in Section 2), and meet all applicable requirements set forth in Sections 2 through 20 of this Specification and all governing regulatory agency requirements. Each containment shall be tailored to meet the needs of the “work area” to be enclosed and include all requirements as set forth in the above related sections and government regulations applicable to asbestos related work.

Sufficient negative air units shall be installed which will provide a minimum of 4 air changes per hour and a minimum of -0.030" air pressure differential, while the zippered doors are opened for bag-out of waste. A digital manometer recording shall be made of all days when in use. The digital recording manometer shall have at a minimum the ability of displaying three digits after the zero (0.000). The manometer tapes shall reflect the correct location, times, and dates of all measurements recorded. Once these requirements have been met and the negative pressure has been established, the Contractor shall request a pre-start visual inspection from Owner’s asbestos consultant.

A three-stage decontamination unit is required and shall be comprised of zippered doors between the chambers. Flapped doors will not be acceptable. The decontamination unit shall be cleaned daily of all debris, bags, tape, towels, etc. and shall remain clean during the day. The clean room of any three-stage decontamination unit shall be at least 5' in width, 8' in length, and 7' in height. Multiple showers are required if the number of asbestos workers exceeds ten per Title 8 3366 Washing Facilities. When there are less than five employees, the same shower may be used by both sexes if the shower room can be locked from the inside.

Part 24.5 - Contractor Assist Requirements

The asbestos contractor shall provide "contractor assist" services for electrical, plumbing, mechanical, and other trades as necessary and agreed to with the General Contractor, for work to be conducted in spaces such as attics, wall cavities, and mechanical rooms where asbestos contamination is present, or where ACM are to be disturbed in order to perform the work.

Altadena Library

Contractor assist work shall require the asbestos contractor to construct a mini-cube enclosure, create access to the contaminated area, and wet wipe or HEPA vacuum all dust and debris from the immediate work area as needed to create a "clean" environment for the trade workers to work. All procedures specified in Section Mini-Cube Enclosure Requirements shall be followed.

Part 24.6 - Worker Protection

At a minimum half-face respirator with P-100 (HEPA) cartridges, disposable coveralls, and hard sole shoes shall be used during the removal and disposal of all asbestos containing material. Full-face powered air purifying respirators (PAPR) with P-100 cartridges are required for all Class I work. Workers wearing tennis shoes, sandals, or soft sole type shoes will not be allowed to work on roofs or inside containments regardless of the activity being performed. Worker protection for all other work areas shall comply with Cal/OSHA requirements and shall follow the respirator selection as specified in Title 8 section 5144.

Part 24.7 - Electrical and Water Hook-Ups

The Owner shall provide access for electrical and water hook-ups when available. The Contractor shall install a temporary electrical spider box to an existing electrical panel using a licensed qualified electrical contractor. The Contractor is responsible for all hook-ups, electrical cords, water hoses, and hose bibs necessary for attachment.

Part 24.8 - Visual and Air Clearance Criteria

The Contractor shall perform a pre-final visual of the removal area and adjacent surfaces prior to requesting that Owner's asbestos consultant conduct a final visual inspection. The pre-final visual performed by the Contractor shall verify that all materials have been completely removed from the work area, and that the work area meets the requirements specified in Section 17.

Upon completion of the pre-final visual inspection by the Contractor, a final visual of the containment area will be performed by Owner's asbestos consultant. The Contractor shall not be released to encapsulate the containment until receiving acceptance by Owner's asbestos consultant confirming the removal area and the containment have met the criteria of Owner's asbestos consultant for completeness of removal of asbestos materials and cleanliness of the containment barriers and surfaces.

Clearance air sampling will be performed following passing the visual inspection, encapsulation of the containment has taken place and a sufficient amount of time has passed to allow the encapsulant to dry. All clearance air samples will be analyzed by transmission electron microscopy (TEM), and performed by a NIST/NVLAP accredited laboratory. The clearance criteria for releasing the Contractor is the AHERA Standard, with the average of all air samples less than 70 asbestos structures per square millimeter. Aggressive air sampling will be used, which includes using a leaf blower in conjunction with fans to dislodge any remaining dust within the containment.

Part 24.9 - Owner's Responsibility

Not Used.

Part 24.10 - Disposal Requirements

Disposal of all friable hazardous asbestos containing waste must be tracked utilizing a current copy of a Uniform Hazardous Waste form. These forms are to be properly filled out by the Contractor and signed by an authorized Owner's representative. All non-friable non-hazardous asbestos waste shall be tracked using a Bill of Lading or equivalent and signed by an authorized Owner's representative. No individual or representative other than the Owner's designated representative is permitted to sign Uniform Hazardous Waste forms or bill of Lading or equivalent for the Owner.

It shall be the responsibility of the Contractor to notify Owner's agent/site representative and coordinate having a hazardous waste manifest properly signed by a Owner representative.

Part 24.11 - Work Periods

Work periods shall be scheduled with Owner's agent/site representative at least 48 hours prior to the start of any shift. If weekend work is to be conducted, shift times are to be established and approved by Owner's agent/site representative. All shifts are to consist of 8 hours and will begin at the time specified and agreed to by Owner's agent/site representative and the abatement contractor.

PREPARED BY:



Matt Reilly
Certified Asbestos Consultant No. 18-6208
CDPH Lead Inspector/Assessor/Supervisor No. 4855/4854
Direct Line: 925-344-1872
Email: Matthew.Reilly@oneatlas.com

Altadena Library

Part 24.12 - Pre-Construction Submittal List

1. _____ Copy of State of California - Contractor's State License

2. _____ Copy of State of California CSLB Active License

3. _____ Copy of State of California CSLB Asbestos Certification

4. _____ Copy of Department of Industrial Relations; Division of Occupational Safety and Health; Certificate of Registration for Asbestos-related Work

5. _____ Copy of signed statement from company officer listing citations and pending proceedings against the Contractor, or if there have been no citations, a copy of the statement that no actions by regulatory agencies have occurred in the last three years signed by an officer of the company.

6. _____ General Liability Insurance Certificate

    a) ___ Occurrence
    b) ___ Asbestos/Lead Activities or Abatement Certificate
    c) ___ Owner Named as Additional Insured
    d) ___ Consultant Named as Additional Insured

7. _____ Auto Insurance

8. _____ Workers' Compensation Insurance

9. _____ Statement of Non-use of Sub-contractors or

    a) ___ Name of Each Sub-contractor
    b) ___ License Number for Each Sub-contractor
    c) ___ General Liability Insurance Certificate for Each Sub-contractor

        1) ___ Minimum Coverage of $1,000,000.00
        2) ___ Owner Named as Additional Insured
        3) ___ Consultant Named as Additional Insured

    d) ___ Auto Insurance Certificate for Each Sub-contractor
    e) ___ Workers' Compensation Insurance Certificate for Each Sub-contractor

        1) ___ Owner Named as Additional Insured
        2) ___ Consultant Named as Additional Insured

10. _____ Written Notification to CAL/OSHA

11. _____ Written Notification to SCAQMD

12. _____ Copies of City Permits (e.g. Parking or Waste container) or Statement That no Permits are Required

13. _____ Statement That no Equipment Will be Rented for use With Asbestos or a Statement From Each Rental Company Acknowledging Their Equipment Will be Exposed to Asbestos

Altadena Library

14. _____ Non-Emergency Telephone Numbers

    a) ___ Local Police Department
    b) ___ Sheriff Department
    c) ___ Fire Department
    d) ___ Emergency Medical Facility and Directions to That Facility From the Site

15. _____ Written Emergency Plans

16. _____ Written Work Plan

17. _____ Written Schedule

18. _____ Worker Documentation (Must Include at Least One Supervisor)

    a) ___ Training Records for Asbestos - AHERA (Supervisor and Worker)*
    b) ___ Medical Examination Written Opinion Final Report for Each Employee*
    c) ___ Respiratory Fit Tests for Each Employee*

19. _____ Equipment list, SDS for all materials to be used on the project, including but not limited to, spray glue, encapsulants, wetting agents, mastic remover, etc.

20. _____ Name of laboratory/person used for PCM analysis and copy of current NVLAP Certificate of Accreditation (if applicable), and most recent AIHA Proficiency Analytical Testing (PAT) Program results.

21. _____ Written Statement That OSHA Monitoring Will be Performed During the Project

22. _____ Manufacturers documentation of 5.0 micron filter capability required for waste water

23. _____ Name of Transporter

24. _____ Hazardous Waste Transporter Registration (if applicable) Is required only if work to be conducted involves the removal and disposal of “hazardous” asbestos waste as determined either by definition or designated within the Asbestos Abatement Specifications/Procedures and associated attached Exhibits.

25. _____ Waste Facility Documentation

    a) ___ Name and Site Address
    b) ___ EPA Identification Number (if applicable)
    c) ___ Copy of Current Permit Authorizing Asbestos Waste Receipt and Disposal

26. _____ Signed Copy of Competent Person Form Acknowledging Reading and Understanding the Specifications (Last Page of Forms Sections of Document) <u>This must be signed by the asbestos Contractor/Supervisor who will onsite, not in the contractor’s office.</u>

<u>Note:</u> Items 9, 12, 13, and 21 may be addressed in a single letter as applicable.

* No Contractor’s worker will be allowed to conduct asbestos related work, enter a containment, or regulated area prior to verification of AHERA, respirator, and medical

documentation. This verification must either be onsite or faxed to Owner's agent/site representative prior to entry.

Part 24.13 - Interim Construction Submittals

Upon request by the Owner or Owner's Representative, the Contractor shall provide copies of documentation identified to be pertinent to the project.

Part 24.14 - Post Construction Submittal List

Contractor shall provide the following post-construction submittals to Owner's Representative within thirty (30) days of the completion of asbestos abatement work.

1. _____ Copies of revised notifications to regulatory agencies.
2. _____ Information on all new workers not covered by the pre-construction submittals and not submitted during the project.
3. _____ A copy of worker exposure monitoring results collected in compliance with DOSH regulations (Title 8 CCR, Section 1529) including daily/representative/full-shift/breathing-zone air samples, and 30-minute excursion samples.
4. _____ A copy of the worker/visitor log showing the following for all persons entering the work area: date, name, social security number, entering, and leaving times, company or agency represented, and reason for entry. The Contractor's time records will not be accepted in lieu of a worker/visitor log.
5. _____ Copies of all accident reports submitted during the course of work. **If no accidents occur during the project this should be stated in writing by the Contractor.**
6. _____ Receipts from the landfill operator acknowledging the Contractor's delivery of wastes, including dates, container types and quantities, tare weights or material delivered, and all appropriate signatures.
7. _____ A complete record of the air filtration devices used certifying DOP testing (if performed) and a circular chart recording, indicating continuous operation and documenting differential air pressure.
8. _____ Copies of DOP Testing Performed on HEPA Equipment not Previously Submitted
9. _____ Manometer graphs identifying project name, date, and location.
10. _____ A copy of the asbestos waste record showing dates, times, manifest numbers, quantities of wastes, types of containers removed from the work area, the hauler, and the signature of the recorder.
11. _____ A Land Disposal Restrictions Notification and Certification
12. _____ Completed Uniform Hazardous Waste forms
13. _____ Other Documents as Requested

Altadena Library

SECTION 25. ASBESTOS RESULTS LIST

Any material not specified on the following list which the Contractor encounters at this site must be considered as “suspect” and “assumed” to contain asbestos per US EPA. The only items excluded from this statement are; bare wood, glass, and metal.

Table 1 – Asbestos Survey Results

Sample Number	Homogeneous Material	Location	Approximate Quantity	Asbestos Content
001	Carpet Mastic, Under Green 2’ x 2’ Carpet	Main Floor, Fiction Reading Area	900 SF	ND
002	Carpet Mastic, Under Green 2’ x 2’ Carpet	Main Floor, Service Desk	R001	ND
003	Carpet Mastic, Under Green 2’ x 2’ Carpet	Main Floor, Librarian Office	R001	ND
004	Carpet Mastic Under Blue 2’ x 2’ Carpet	Main Floor, Near Children’s Books	3,000 SF	ND
005	Carpet Mastic Under Blue 2’ x 2’ Carpet	Main Floor, Family Service Desk	R004	ND
006	Carpet Mastic Under Blue 2’ x 2’ Carpet	Main Floor, Outside Restroom	R004	ND
007	Carpet Mastic Under Orange 2’ x 2’ Carpet	Main Floor, West Section	1,200 SF	ND
008	Carpet Mastic Under Orange 2’ x 2’ Carpet	Main Floor, West Section	R007	ND
009	Carpet Mastic Under Orange 2’ x 2’ Carpet	Main Floor, West Section	R007	ND
010	Vinyl Wood Plank, Green	Main Floor, North Magazine Area	480 SF	ND
011	Vinyl Wood Plank, Green	Main Floor, North Magazine Area	R010	ND
012	Vinyl Wood Plank, Green	Main Floor, Near Elevator	R010	ND
013	Vinyl Wood Plank Mastic (Associated 010)	Main Floor, North Magazine Area	480 SF	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
014	Vinyl Wood Plank Mastic (Associated 011)	Main Floor, North Magazine Area	R013	ND
015	Vinyl Wood Plank Mastic (Associated 012)	Main Floor, Near Elevator	R013	ND
016	Vinyl Wood Plank, Blue	Main Floor, Near Children and Family Service Desk	290 SF	ND
017	Vinyl Wood Plank, Blue	Main Floor, Near Children and Family Service Desk	R016	ND
018	Vinyl Wood Plank, Blue	Main Floor, Near Children and Family Service Desk	R016	ND
019	Vinyl Wood Plank Mastic (Associated 016)	Main Floor, Near Children and Family Service Desk	290 SF	ND
020	Vinyl Wood Plank Mastic (Associated 017)	Main Floor, Near Children and Family Service Desk	R019	ND
021	Vinyl Wood Plank Mastic (Associated 018)	Main Floor, Near Children and Family Service Desk	R019	ND
022	Vinyl Wood Planks, Orange	Main Floor, Northwest Section	330 SF	ND
023	Vinyl Wood Planks, Orange	Main Floor, Northwest Section	R022	ND
024	Vinyl Wood Planks, Orange	Main Floor, Northwest Section	R022	ND
025	Vinyl Wood Planks Mastic (Associated 022)	Main Floor, Northwest Section	330 SF	ND
026	Vinyl Wood Planks Mastic (Associated 023)	Main Floor, Northwest Section	R025	ND
027	Vinyl Wood Planks Mastic (Associated 024)	Main Floor, Northwest Section	R025	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
028	Vinyl Wood Planks, Brown	Main Floor, Near Stairwell	1,000 SF	ND
029	Vinyl Wood Planks, Brown	Main Floor, Reception Office Area	R028	ND
030	Vinyl Wood Planks, Brown	Main Floor, Circulation Room	R028	ND
031	Vinyl Wood Planks Mastic (Associated 028)	Main Floor, Near Stairwell	1,000 SF	ND
032	Vinyl Wood Planks Mastic (Associated 029)	Main Floor, Reception Office Area	R031	ND
033	Vinyl Wood Planks Mastic (Associated 030)	Main Floor, Circulation Room	R031	ND
034	**9” x 9” Vinyl Floor Tile, Off White with Brown Smudges**	**Main Floor, Circulation Room**	**400 SF**	**3% Chrysotile**
035	**9” x 9” Vinyl Floor Tile, Off White with Brown Smudges**	**Main Floor, Circulation Room**	**R034**	**4% Chrysotile**
036	**9” x 9” Vinyl Floor Tile, Off White with Brown Smudges**	**Main Floor, Janitorial Room**	**R034**	**7% Chrysotile**
037	**Vinyl Floor Tile Mastic (Associated 034)**	**Main Floor, Circulation Room**	**400 SF**	**7% Chrysotile**
038	**Vinyl Floor Tile Mastic (Associated 035)**	**Main Floor, Circulation Room**	**R037**	**10% Chrysotile**
039	**Vinyl Floor Tile Mastic (Associated 036)**	**Main Floor, Janitorial Room**	**R037**	**10% Chrysotile**
040	Ceramic Floor Tile Mortar	Main Floor, Men’s Restroom	100 SF	ND
041	Ceramic Floor Tile Mortar	Mid-Level, Men’s Restroom	R040	ND
042	Ceramic Floor Tile Mortar	Lower Level, Women’s Restroom	R040	ND
043	4” Baseboard	Main Floor, Librarian Office	450 LF	ND
044	4” Baseboard	Main Floor, Near Restrooms	R043	ND
045	4” Baseboard	Main Floor, Circulation Room	R043	ND
046	4” Baseboard Mastic (Associated 043)	Main Floor, Librarian Office	450 LF	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
047	4” Baseboard Mastic (Associated 044)	Main Floor, Near Restrooms	R046	ND
048	4” Baseboard Mastic (Associated 045)	Main Floor, Circulation Room	R046	ND
049	**Interior Stucco**	**Main Floor, South Ceiling**	**4,500 SF**	**0.8% Chrysotile by 1,000 PC (ACCM)**
050	**Interior Stucco**	**Main Floor, South Column**	**R049**	**0.8% Chrysotile by 1,000 PC (ACCM)**
051	**Interior Stucco**	**Main Floor, West Column**	**R049**	**1% Chrysotile by 1,000 PC (ACCM)**
052	**Interior Stucco**	**Main Floor, North Ceiling**	**R049**	**0.8% Chrysotile by 1,000 PC (ACCM)**
053	**Interior Stucco**	**Main Floor, East Ceiling**	**R049**	**1% Chrysotile by 1,000 PC (ACCM)**
054	Plaster	Main Floor, Outside Men’s Restroom	1,500 SF	ND
055	Plaster	Main Floor, Outside Women’s Restroom	R054	ND
056	Plaster	Main Floor, Janitorial Room in Circulation	R054	ND
057	Plaster	Main Floor, Women’s Restroom Ceiling	R054	ND
058	Plaster	Main Floor, Men’s Restroom Ceiling	R054	ND
059	CMU Mortar	Main Floor, Southwest Section	5,000 SF	ND
060	CMU Mortar	Main Floor, Librarian Office	R059	ND
061	CMU Mortar	Main Floor, Near Elevator	R059	ND
062	Vinyl Wood Plank, Grey	Mid-Level, Foyer	150 SF	ND
063	Vinyl Wood Plank, Grey	Mid-Level, Foyer	R062	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
064	Vinyl Wood Plank, Grey	Mid-Level, Foyer	R062	ND
065	Vinyl Wood Plank Mastic (Associated 062)	Mid-Level, Foyer	150 SF	ND
066	Vinyl Wood Plank Mastic (Associated 063)	Mid-Level, Foyer	R065	ND
067	Vinyl Wood Plank Mastic (Associated 064)	Mid-Level, Foyer	R065	ND
068	**9” x 9” Vinyl Floor Tile, Beige**	**Mid-Level, Electrical Room**	**1,000 SF**	**3% Chrysotile**
069	**9” x 9” Vinyl Floor Tile, Beige**	**Mid-Level, Electrical Room**	**R068**	**3% Chrysotile**
070	**9” x 9” Vinyl Floor Tile, Beige**	**Mid-Level, Storage Closet**	**R068**	**3% Chrysotile**
071	**Vinyl Floor Tile Mastic (Associated 068)**	**Mid-Level, Electrical Room**	**1,000 SF**	**6% Chrysotile**
072	**Vinyl Floor Tile Mastic (Associated 069)**	**Mid-Level, Electrical Room**	**R071**	**7% Chrysotile**
073	**Vinyl Floor Tile Mastic (Associated 070)**	**Mid-Level, Storage Closet**	**R071**	**10% Chrysotile**
074	Carpet Mastic	Mid-Level, Foyer Steps	150 SF	ND
075	Carpet Mastic	Mid-Level, Foyer Steps	R074	ND
076	Carpet Mastic	Mid-Level, Foyer Steps	R074	ND
077	4” Baseboard	Mid-Level, Electrical Room	80 LF	ND
078	4” Baseboard	Mid-Level, Storage Closet	R077	ND
079	4” Baseboard	Mid-Level, Stage	R077	ND
080	Baseboard Mastic (Associated 077)	Mid-Level, Electrical Room	80 LF	ND
081	Baseboard Mastic (Associated 078)	Mid-Level, Storage Closet	R080	ND
082	Baseboard Mastic (Associated 079)	Mid-Level, Stage	R080	ND
083	4” Baseboard, Brown	Mid-Level, Community Room	100 LF	ND
084	4” Baseboard, Brown	Mid-Level, Community Room	R083	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
085	4” Baseboard, Brown	Mid-Level, Community Room	R083	ND
086	Baseboard Mastic (Associated 083)	Mid-Level, Community Room	100 LF	ND
087	Baseboard Mastic (Associated 084)	Mid-Level, Community Room	R086	ND
088	Baseboard Mastic (Associated 085)	Mid-Level, Community Room	R086	ND
089	Interior Stucco	Mid-Level, Foyer	R090	N*
090	**Interior Stucco**	**Mid-Level, Foyer**	**200 SF**	**0.1% Chrysotile by 1,000 PC (ACCM)**
091	Interior Stucco	Mid-Level, Foyer	R090	N*
092	Wall Tile Mortar	Main Floor, Men’s Restroom	1,500 SF	ND
093	Wall Tile Mortar	Mid-Level, Men’s Restroom	R092	ND
094	Wall Tile Mortar	Lower Level, Women’s Restroom	R092	ND
095	Wall Tile Grout	Main Floor, Men’s Restroom	1,500 SF	ND
096	Wall Tile Grout	Mid-Level, Men’s Restroom	R095	ND
097	Wall Tile Grout	Lower Level, Women’s Restroom	R095	ND
098	**9” x 9” Vinyl Floor Tile, White with Red Smudges**	**Lower Level, Hallway**	**500 SF**	**5% Chrysotile**
099	**9” x 9” Vinyl Floor Tile, White with Red Smudges**	**Lower Level, Hallway**	**R098**	**5% Chrysotile**
100	**9” x 9” Vinyl Floor Tile, White with Red Smudges**	**Lower Level, Hallway**	**R098**	**5% Chrysotile**
101	**Vinyl Floor Tile Mastic (Associated 098)**	**Lower Level, Hallway**	**500 SF**	**8% Chrysotile**
102	**Vinyl Floor Tile Mastic (Associated 099)**	**Lower Level, Hallway**	**R101**	**8% Chrysotile**
103	**Vinyl Floor Tile Mastic (Associated 100)**	**Lower Level, Hallway**	**R101**	**7% Chrysotile**

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
104	Vinyl Sheet Flooring	Lower Level, Storage Room	200 SF	ND
105	Vinyl Sheet Flooring	Lower Level, Storage Room	R104	ND
106	Vinyl Sheet Flooring	Lower Level, Storage Room	R104	ND
107	Vinyl Sheet Flooring Mastic (Associated 104)	Lower Level, Storage Room	200 SF	ND
108	Vinyl Sheet Flooring Mastic (Associated 105)	Lower Level, Storage Room	R107	ND
109	Vinyl Sheet Flooring Mastic (Associated 106)	Lower Level, Storage Room	R107	ND
110	Flooring Felt (Associated 104)	Lower Level, Storage Room	200 SF	ND
111	Flooring Felt (Associated 105)	Lower Level, Storage Room	R110	ND
112	Flooring Felt (Associated 106)	Lower Level, Storage Room	R110	ND
113	Vinyl Wood Floor, Beige	Lower Level, Technical Services	200 SF	ND
114	Vinyl Wood Floor, Beige	Lower Level, Technical Services	R113	ND
115	Vinyl Wood Floor, Beige	Lower Level, Technical Services	R113	ND
116	Vinyl Wood Floor Mastic (Associated 113)	Lower Level, Technical Services	1,200 SF	ND
117	Vinyl Wood Floor Mastic (Associated 114)	Lower Level, Technical Services	R116	ND
118	Vinyl Wood Floor Mastic (Associated 115)	Lower Level, Technical Services	R116	ND
119	Vinyl Wood Floor, Brown	Lower Level, Staff Lounge	240 SF	ND
120	Vinyl Wood Floor, Brown	Lower Level, Staff Lounge	R119	ND
121	Vinyl Wood Floor, Brown	Lower Level, Staff Lounge	R119	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
122	Vinyl Wood Floor Mastic	Lower Level, Staff Lounge	240 SF	ND
123	Vinyl Wood Floor Mastic	Lower Level, Staff Lounge	R122	ND
124	Vinyl Wood Floor Mastic	Lower Level, Staff Lounge	R122	ND
125	4” Baseboard, Beige	Lower Level, Hallway	150 LF	ND
126	4” Baseboard, Beige	Lower Level, Hallway	R125	ND
127	4” Baseboard, Beige	Lower Level, Hallway	R125	ND
128	Baseboard Mastic (Associated 125)	Lower Level, Hallway	150 LF	ND
129	Baseboard Mastic (Associated 126)	Lower Level, Hallway	R128	ND
130	Baseboard Mastic (Associated 127)	Lower Level, Hallway	R128	ND
131	4” Baseboard, Brown	Lower Level, Technical Services	120 LF	ND
132	4” Baseboard, Brown	Lower Level, Technical Services	R131	ND
133	4” Baseboard, Brown	Lower Level, Technical Services	R131	ND
134	Baseboard Mastic (Associated 131)	Lower Level, Technical Services	120 LF	ND
135	Baseboard Mastic (Associated 131)	Lower Level, Technical Services	R134	ND
136	Baseboard Mastic (Associated 131)	Lower Level, Technical Services	R134	ND
137	Plaster	Lower Level, Hallway	R138	ND
138	**Plaster**	**Lower Level, Library Storage**	**2,000 SF**	**0.9% Chrysotile by 1,000 PC (ACCM)**
139	**Plaster**	**Lower Level, Technical Services**	**R138**	**1% Chrysotile by 1,000 PC (ACCM)**
140	CMU Mortar	Lower Level, Library Storage	1,500 SF	ND

Altadena Library

Table 1 – Asbestos Survey Results				
Sample Number	**Homogeneous Material**	**Location**	**Approximate Quantity**	**Asbestos Content**
141	CMU Mortar	Lower Level, Hallway Lockers	R140	ND
142	CMU Mortar	Lower Level, Technical Services	R140	ND
143	Interior Stucco	Lower Level, Men's Restroom	4,000 SF	ND
144	Interior Stucco	Lower Level, Hallway Exit	R143	ND
145	Interior Stucco	Lower Level, Hallway Lockers	R143	ND
146	Interior Stucco	Lower Level, Technical Services	R143	ND
147	Interior Stucco	Lower Level, Library Storage	R143	ND
148	Penetrating Plastic	Roof, Column Support	200 SF	ND
149	Penetrating Plastic	Roof, Column Support	R148	ND
150	Penetrating Plastic	Roof, Column Support	R148	ND
151	Rolled on Roofing Asphalt	North Roof	3,500 SF	ND
152	Rolled on Roofing Asphalt	East Roof	R151	ND
153	Rolled on Roofing Asphalt	West Roof	R151	ND
154	Vent Mastic	Roof, HVAC	200 LF	ND
155	Vent Mastic	Roof, HVAC	R154	ND
156	Vent Mastic	Roof, HVAC	R154	ND

Note 1.: **Category I Non-friable ACM** is asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than one percent asbestos by area.

Note 2.: **Category II Non-friable ACM** is any material, excluding Category I non-friable ACM, containing more than one percent asbestos, which is non-friable such as transite and other concrete based products.

Note 3.: **Regulated Asbestos-Containing Material (RACM)** is any friable material, any Category I non-friable ACM which has become friable, any Category I non-friable ACM which will be or has been subjected to sanding, grinding, cutting, or abrading, any Class II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to a powder by the forces expected to act on the material in the course of demolition or renovation operations.

Note 4.: **Asbestos Containing Construction Materials (ACCM)** is a manufactured construction material containing greater than 0.1% asbestos by weight by the PLM method.

Altadena Library

Note 5.: The terms “assume” and “presume” mean the named material is considered positive for containing asbestos and must be treated accordingly, until properly sampled in compliance with 40 CFR, Part 763 Asbestos-Containing Materials in Schools; Final Rule and Notice.

SECTION 26. FORMS

DOCUMENTATION OF PROPER AIR FLOW RATE FOR PAPR’S

PROJECT: _____

JOB FOREMAN: _____ **DATE:** _____

WORKER’S NAME AND PAPR’S MODEL & SERIAL NUMBER	MEETS MANUFACTURERS REQUIREMENTS FOR AIR FLOW MORNING SHIFT MEASURED FLOW PASS / FAIL		MEETS MANUFACTURERS REQUIREMENTS FOR AIR FLOW AFTERNOON SHIFT MEASURED FLOW PASS / FAIL	

The air flow rate of every PAPR must be checked by the Job Foreman each shift, prior to any worker entering containment.

Manufacturers Recommended Air Flow: _____

Respirator Type(s): _____

Altadena Library

ASBESTOS ABATEMENT
PRE-START VISUAL INSPECTION REPORT

CLIENT: _____ **PROJECT #:** _____

SITE: _____

CONTRACTOR: _____

REMOVAL LOCATION (Building and Containment): _____

_____

WORK TO BE CONDUCTED: _____

_____

_____

PRE-START VISUAL INSPECTION RESULT

DATE: _____

FINDINGS: _____

COMMENTS: _____

_____

_____

_____

_____
Signature of Owner's Representative

Altadena Library

FINAL VISUAL CLEARANCE REPORT

CLIENT: _____ **PROJECT #:** _____

SITE: _____

CONTRACTOR: _____

REMOVAL LOCATION (Building and Containment): _____

_____

WORK CONDUCTED: _____

_____

_____

FINAL VISUAL INSPECTION RESULT

DATE: _____ **FINDINGS:** _____

COMMENTS: _____

_____

_____

_____

_____
Contractor Supervisor Requesting Inspection (Date and Time)

_____
Signature of Owner's Representative

PROJECT SITE NAME **EXHIBIT A**

Competent Person Acknowledgment

The Cal/OSHA standard for asbestos related construction work, found in 8 CCR, 1529, outlines specific duties and qualifications of the "Competent Person." Find below a overview of these qualifications and responsibilities. The competent person must be authorized by their employer to take prompt corrective measures to eliminate hazards on the job and protect their workers safety. The competent person must be the Supervisor onsite who is capable of:

- Identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees.
- Identifying existing asbestos hazards in the work place and selecting the appropriate control strategy for asbestos exposure.

The duties of the competent persons include, but are not limited to:

- Frequent and regular inspections of the job site, materials, and equipment.
- Supervise or perform the set-up of the regulated area and/or containment.
- Ensure the integrity of the regulated area and/or containment.
- Set up procedures to control entry to and exit from the regulated area and/or containment.
- Supervise all employee exposure monitoring and assure it is conducted according to regulatory requirements.
- Ensure that employees working within the regulated area(s) wear respirators and protective clothing as required by regulation.
- Ensure that employees working set up, use, and remove engineering controls, use work practices and personal protective equipment in compliance with the regulations.
- Ensure that employees use hygiene facilities and observe the decontamination procedures specified in the regulation.
- Ensure through continuing onsite surveillance that engineering controls are functioning properly and employees are using proper work practices.
- Ensure that notification requirements of the regulation are met.

Additionally, the EPA requires the competent person to be trained in the Federal NESHAP regulations, the means to comply with them, and be on site during all removal operations.

I_____have the authority to take prompt corrective measures to eliminate hazards on the job and protect workers safety. Furthermore, I have read and understand my duties as outlined above and under the applicable regulations, and will exercise them to best of my ability.

_____ Date:_____Employer:_____
Signature of Competent Person Who Will Be Onsite

_____
Printed Name of Competent Person Who Will Be Onsite

REQUIREMENTS FOR DISTURBANCE OF LEAD IN CONSTRUCTION TABLE OF CONTENTS

Table of Contents

REQUIREMENTS FOR THE DISTURBANCE OF LEAD IN CONSTRUCTION 3
PART 1.0 GENERAL REQUIREMENTS 3
1.1 Introduction 3
1.2 Definitions 4
1.3 Regulatory Compliance 8
1.3.1 Environmental Protection Agency (EPA) 8
1.3.2 Housing and Urban Development (HUD) 9
1.3.3 California Department of Public Health (CDPH) 9
1.3.4 California Division of Occupational Safety and Health Administration (DOSH) 10
1.4 Lead-Work Pre-Job Notification Requirements 11
1.5 Lead Training Requirements 11
1.5.1 Minimal Training Required For All Workers Exposed To Lead 11
1.5.2 Required Training For Those Exposed Over the Action Level Or Who Conduct Trigger Tasks 12
1.5.3 Required Training For Those Who Are Reasonably Expected To Be Exposed Over The PEL And/Or Conduct Trigger Tasks On Over 100 Square Feet of Material 12
1.6 Required Submittal Documents 13
1.6.1 Submittals Prior To The Start Of Work 13
1.6.2 Submittals Provided During The Work Or Following Completion Of The Work If Applicable 16
1.7 Third-party Oversight 17
1.8 Air Sampling By The Owner and/or Project Monitor 17
1.9 Notification of Employers of Employees in Adjacent Areas 17
1.10 Suspension Of Work 18
1.11 Pre-Start Meeting 18
1.12 Testing For Lead In Paints, Coatings, Ceramic Tile, And Other Materials 18
PART 2.0 MATERIALS AND EQUIPMENT 18
2.1 Fire Resistant Plastic Sheeting (Poly) 18
2.2 Challenge Testing Of HEPA Filtration Systems 19
2.3 Vacuum-Assisted Tools 19
2.4 Power Washing 19
2.5 Personal Protective Equipment 19
2.6 Rental Equipment 20
PART 3.0 EXECUTION 20
3.1 Summary 20

REQUIREMENTS FOR DISTURBANCE OF LEAD IN CONSTRUCTION
TABLE OF CONTENTS

3.2 PEL and Action Level Compliance Requirements....20
3.2.1 Personal Air Sampling....21
3.3 Work Involving Whole Component Removal or Demolition Of Entire Structures....21
3.4 Prohibited Work Practices....22
3.5 Competent Person....22
3.6 Work Site Preparation & Containment Requirements....23
3.6.1 Exterior Work Site Preparation & Containment....23
3.6.2 Interior Site Preparation & Containment....24
3.6.3 Containment Requirements- Removal of Ceramic Tiles or use of Mechanical Means....24
3.6.4 Decontamination Procedures....28
3.6.5 Avoiding Contamination Of Adjacent Areas By Proper Decontamination....28
3.6.6 Approval Prior To Start Of Work....28
3.7 Wet Work Practices....29
3.8 Prompt Cleanup Of Debris....29
3.9 Final Cleanup Of The Work Area....29
3.9.2 Cleanup Of Interior Work Areas....29
3.10 Final Inspection Of The Work Area....30
3.11 Power Washing of Exterior Building Surfaces....31
3.11.1 Waste Water Discharge Permits....31
3.11.2 Required Work Practices For Power Washing....31
3.12 Lead Waste Management....33
3.12.1 Lead Waste Testing....33
3.12.2 Hazardous Waste Manifests....33
3.12.3 Waste Containers....33
3.13 Alternative Work Plans....34
PART 4.0 DOCUMENTATION SUBMITTAL REQUIREMENTS....34
4.1 - Pre-Construction Submittal List....35
4.2 Submittals Provided During The Work (Or Following Completion Of The Work If Applicable)....38
4.3 Lead Results List....38

Altadena Library

REQUIREMENTS FOR THE DISTURBANCE OF LEAD IN CONSTRUCTION

PART 1.0 GENERAL REQUIREMENTS

1.1 Introduction

These specifications are designed to minimize and control potential lead hazards during the disturbance of materials that contain lead. These procedures and precautions apply to the disturbance of lead that may result from the preparation of surfaces prior to painting, from the drilling into, cutting into, or removal of building components containing or covered with lead, or the demolition of buildings and/or structures that contain lead either in or on their surfaces.

The primary focus of these specifications is to address the work practices and procedures that the Contractor and/or other subcontractors must follow when conducting activities that may disturb lead in paint or other coatings or lead in ceramic tile glaze.

Lead in measurable amounts is common in paints, varnishes, stains, and ceramic tiles found in buildings constructed prior to 1978. All interior and exterior painted, stained or varnished building surfaces are assumed to contain various concentrations of lead. The Contractor or other subcontractors may also encounter other building products such as lead sheeting, roof flashing or roof vents that may contain lead until proven otherwise.

The Contractor and other subcontractors working on this project must treat these suspect lead-containing products as containing lead unless the materials have been tested and proven not to contain lead. Unless tested, California Division of Occupational Safety and Health (DOSH) regulations will apply if any of these surfaces or materials will be disturbed during the project work.

This specification requires that DOSH and California Department of Public Health (CDPH) regulations regarding the training of workers disturbing lead and work practices employed during that disturbance be utilized on this project. The training requirements for workers and supervisors on this project are summarized in Part 1.5. Lead Training Requirements. The Contractor and other subcontractors disturbing lead must be familiar with the CDPH requirements regarding containment of lead debris and the DOSH Lead in Construction Standard. Those requirements are summarized below in Part 1.3 Regulatory Compliance.

In summary, the Contractor and subcontractors shall utilize engineering controls to limit the release of lead dust or debris. These engineering controls may include, but are not limited to, using wet methods, using tools with vacuum recovery systems with High Efficiency Air Particulate (HEPA) filtration, using vacuums with HEPA filtration, using negative air pressure differential systems, and by the prompt cleanup of any lead-containing debris that the work might produce. Dry scraping, sanding, grinding, or abrading lead-containing materials is not permitted. All work that disturbs lead will require a containment. The containment may be as simple as plastic sheeting on the floor or ground when drilling minor penetrations or scraping paint on exterior surfaces. For the demolition of ceramic tile and any painted wall systems, it is likely to require the Contractor construct a full containment for the area and utilize a negative air pressure differential system. The requirements for work practices and containment are described in Part 3.5 Work Site Preparation & Containment Requirements.

The requirements of this specification apply to all employers who have employees who may reasonably be exposed to lead on this project. This includes the Contractor, who will normally be an environmental contractor such as an asbestos abatement contractor, or a painting contractor utilizing CDPH lead certified workers and supervisors. In addition, this specification applies to all subcontractors conducting work on this project who have employees who may disturb lead by drilling, cutting, scraping, or demolishing materials containing lead.

No Contractor shall begin work which will disturb known or suspect lead-containing surfaces or materials in a manner that may expose a worker to lead containing dust, create a potential for building contamination, or create possible lead containing waste, until all required pre-construction documentation has been reviewed and written approval has been received from the Owner and/or Project Monitor/Project Supervisor.

Activities expected to disturb lead-containing materials include, but are not limited to, painting preparation work such as scraping or sanding, penetration of painted surfaces through drilling or cutting, demolition of painted surfaces, removal of painted building components, and removal, drilling, or cutting of ceramic wall tiles. If the Contractor or subcontractors are observed conducting such activities without having written approval from the Owner and/or Project Monitor, they will be instructed to stop work. Work will not be allowed to resume until the Owner and/or Project Monitor provides approval for the work to begin.

This project involving potential disturbance of lead in the various painted materials is not considered a lead abatement project. The renovation project at this site would be considered “lead related construction work”; therefore, it is Atlas opinion the contractor is not required to submit a CDPH Form 8551 for this project.

1.2 Definitions

Action Level - Airborne exposure to lead at or above 30 µg/m3 over an eight-hour-time-weighted average as discussed in 8 CCR 1532.1. Typically, when employees are exposed over the Action Level, the employer must provide blood testing, training in compliance with 8 CCR 1532, and air sampling.

Air Filtration Unit - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity air flow into contaminated areas from adjacent uncontaminated areas. At a minimum, the air intake for the air filtration device must have a pre-filter on it which can be changed within the containment area. In most cases, air filtration devices will need to pass challenge testing by DOP before they are allowed to be used on site.

Airlock - A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

Air Monitoring - The process of measuring the content of a known volume of air collected during a specific period.

Blood Testing - Blood testing for lead and zinc protoporphyrin in compliance with the requirements for medical surveillance as listed in 8 CCR 1532.1.

Cal/OSHA - California Division of Occupational Safety and Health. A California agency that implements and enforces numerous health and safety standards regarding lead.

Certified Lead Supervisor and Worker - Supervisors and workers currently certified by the California Department of Public Health (CDPH).

Challenge Testing - Process used to verify that HEPA-filtered equipment does not leak or exhaust asbestos, lead, or other particulate. This testing must be done by a testing company, not affiliated with the Contractor, and approved by the Owner and Project Monitor. Challenge testing normally uses an oil mist as the challenge agent and measures how much, if any, of the agent is exhausted from the machine being tested.

Clean Room - An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of workers' street clothes and clean protective equipment. The term also includes the uncontaminated area or room of a Waste Transfer Airlock.

Containment - Isolation of the work area from the rest of the building to prevent escape of lead in dust, debris or in the air.

Contractor - The Contractor is the person or entity identified as such in the Contract Documents as being responsible for the environmental work as done in response to and in accordance with this document. References to the "Contractor" include the Contractor's authorized representatives. The Contractor may be a sub-contractor to the Primary Contractor. The Contractor normally will be responsible for paint preparation work that disturbs lead, paint scraping done prior to the demolition of structures, or the demolition of ceramic tile. The Contractor will typically need to use CDPH certified lead workers and supervisors to conduct their work that disturbs lead. Those employers disturbing smaller amounts of lead such as through drilling, cutting, or small component removal are typically known as a subcontractor for the purposes of this specification.

Critical Barrier - Critical Barriers are used to restrict water and airflow. Critical Barriers are the barriers placed over openings in the walls and ceilings of a work area in order to ensure that lead dust cannot escape the work area via these openings. Unless otherwise specified in these Specifications, critical barriers shall be constructed of at least one layer of six-mil thick poly.

Curtained Doorway - A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms. These are typically constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. Other effective designs are permissible as long as they are approved by the Project Monitor.

Decontamination Enclosure System - A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers, containers, and equipment. This unit shall be constructed with at least two layers of six-mil poly for the floors, walls, and ceiling. The floor of the dirty room shall consist of two layers of six mil poly plus a third layer of poly, four mil or thicker, to be used as a removable drop layer. Drop layer is to be removed as needed, but at least daily.

CDPH - California Department of Public Health. State agency that regulates the disturbance of lead in public buildings and on all structures in California. This agency and relevant regulations are primarily concerned with preventing childhood lead poisoning.

DOP - Dioctylphthalate particles, a testing agent for the efficiency of HEPA filters.

DOT - Department of Transportation, a Federal agency that has regulations and labeling requirements for the transportation of hazardous waste.

DTSC - Department of Toxic Substances Control, a department within the California Environmental Protection Agency charged with implementing and enforcing hazardous waste regulations.

Dust or Debris - Any visible dust or debris remaining in work area will be considered lead-containing residue.

EPA - U.S. Environmental Protection Agency, a Federal agency that developed and enforces various asbestos and lead regulations.

HVAC - Heating, ventilation and air conditioning system.

HEPA Filter - A high efficiency particulate air filter capable of removing particles 0.3 microns in diameter from an air stream with 99.97% efficiency.

HEPA-Filtered-Vacuum Recovery System - This is a mechanical tool that has a shroud or covering over the area of a surface disturbed by a mechanical system in order to eliminate or significantly reduce the amount of dust released to the ambient air by the mechanical process. The shroud must be attached to a working vacuum with HEPA filtration.

HEPA Vacuum - A vacuum system equipped with HEPA filtration. Typically, these units will need to be challenge tested before being allowed to be used inside of buildings on this project.

Lead-Based Paint - Materials meeting the definition of lead-based paint as defined by the California Department of Public Health and the United States Environmental Protection Agency. Currently defined as containing lead in concentrations equal to or greater than 1.0 mg/cm^2, 5000 ppm, or 0.5% by weight.

Lead-Containing Material - Materials that contain measurable, quantifiable amounts of lead. The disturbance of these materials is regulated by Cal/OSHA.

Lead-Containing Hazardous Waste - Materials required by the State of California to be packaged, labeled, transported, and disposed of as a lead hazardous waste.

Lead-Containing Waste Material - Lead-containing waster material that does not need to be treated as a lead-containing hazardous waste.

Lead Project Management or Monitoring Firm – The firm hired by Owner to provide third-party oversight of the disturbance of lead performed on the Owner's property by the Contractor or subcontractors.

Mil - A unit of length or thickness equal to one thousandth of an inch. Generally used when referring to the thickness of plastic (poly) sheeting used to contain the regulated area.

Movable Object - An unattached piece of equipment or furniture in the work area, which can be removed from the work area.

Negative Air Machines - See Air Filtration Units.

NIOSH - The National Institute for Occupational Safety and Health. All respirators used on this project must be approved by NIOSH.

Outside Air - The air outside buildings and structures.

Owner - Property owner where the disturbance of lead will take place. For example, this may be a private building owner or manager, a government body such as a city or county agency, a military base, or a Owner district. This includes the Owner's authorized representatives and employees.

PEL - Permissible Exposure Limit (as used in 8 CCR 1532.1)

Permissible Exposure Limit (PEL) - Airborne exposure to lead above 50 $\mu g/m^3$ over an eight-hour, time-weighted average as discussed in 8 CCR 1532.1. Typically, when employees are exposed over the PEL, the employer must provide blood testing, respirators, protective clothing, shower decontamination, CDPH certification, regulated areas, and air sampling.

Poly - Flame-retardant polyethylene sheeting used to seal critical barriers, create cleaning barriers and drop layers, and to protect surfaces from damage or contamination.

Primary Contractor - The Contractor may not work directly for the Owner but instead subcontract with another contractor such as a general contractor or demolition contractor. The Primary Contractor is the entity responsible for hiring the Contractor if it is not the Owner.

Pre-start Meeting - Meeting held before the beginning of the project in which final details of the project are discussed and Contractor provides project monitor with pre-job submittal packet.

Project Monitor - An individual qualified by virtue of experience and education, designated as the Owner's representative and responsible for overseeing the work that disturbs lead on this project.

Project Monitoring - Activities undertaken by the Project Monitoring Firm for the purpose of monitoring the work done by the Contractor on this project in regards to the disturbance of lead.

Regulated Area - Term used by Cal/OSHA in 8 CCR 1532.1 to indicate a work area where exposure to airborne lead might exceed the Permissible Exposure Limit or where "Trigger Activities" may be performed. The area must be demarcated with signs and barriers designed to keep unauthorized people out of the area. Additionally "Regulated Area" means any measure used to restrict access to an area where personnel impacting lead-containing materials are required to wear respiratory protection and/or protective clothing by the project specifications regardless of airborne concentration of lead.

Shower Room - A room between the clean room and the equipment room in the decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination. Unless specified elsewhere in these specifications, or determined otherwise by the program monitor, the shower shall be on a metal pan to contain water splashed, leaked or spilled out of the shower unit.

Specifications - These written requirements describing procedures the Contractor must follow for this project.

Subcontractor - Contractors working for the Primary (General) Contractor but who are not primarily responsible for environmental work. For example, they may be responsible for, demolition, electrical, plumbing, general construction, minor painting, or other special trades.

Submittals - Pre-construction, interim construction, and post construction documents submitted by the contractor to the Owner as indicated in General Requirements and Bidding Requirements.

Trigger Task - Term commonly used to describe the tasks described by Cal/OSHA in 8 CCR 1532.1 (d)(2). These are tasks or activities that Cal/OSHA believes are expected to result in airborne exposures over the PEL until air monitoring proves otherwise. In brief, trigger tasks include manual demolition, scraping, sanding, using HEPA-attached equipment, using heat guns to remove lead paint, welding, torch cutting, and using other more aggressive techniques. (This is a summary list and does not list all tasks that are considered trigger tasks.) In addition, trigger tasks include any activity reasonably expected to result in airborne exposures to lead above the Permissible Exposure Limit.

View Ports - Clear windows into the regulated work area that allow authorized persons to view work activities inside the regulated area without entering the area. The view ports must be of sufficient number, constructed of materials of sufficient clarity, and be located in areas determined and/or approved of by the Project Monitor. All regulated work areas including mini-enclosures will require view ports unless specifically determined not to be feasible by the Project Monitor.

Visible Emissions - Any emissions containing particulate material that are visually detectable without the aid of instruments. For example, dust, debris, and water leaks are considered visible emissions.

Waste Load-out/Transfer System - A decontamination system utilized for transferring containerized waste from inside to outside of the work area. A series of connected rooms used for the load-out of lead-containing materials that have been properly containerized.

Waste Bags - Waste bags for lead-containing waste must be a minimum of six-mil thickness. In general, double bagging will be required.

Waste Containers - Waste containers are the containers into which lead-containing waste is placed. They may be bags of at least six-mil thickness, metal or fiber barrels, or other containers such as cardboard boxes approved by the Project Monitor. The Contractor is responsible for assuring that the type of container chosen is acceptable to the waste landfill to which the waste will be transported. Waste containers must be labeled according to the requirements of the California Department of Occupational Safety and Health (Cal/OSHA), Department of Toxic Substances Control (DTSC), Department of Transportation (DOT), and the Environmental Protection Agency (EPA).

Waste Transfer Airlock - A decontamination system utilized for transferring containerized waste from inside to outside of the work area.

Wet Cleaning - The process of eliminating lead contamination from building surfaces and objects by using cloths, mops, or other utensils, which have been dampened with water and afterwards thoroughly decontaminated or disposed of as lead-contaminated waste.

Work Area - Designated rooms, spaces, or areas of the project in which the disturbance of lead is to be undertaken or which may become contaminated as a result of such action. A contained work area is a work area, which has been sealed off from adjacent areas.

Work Plan - Contractor's written plan describing how the Contractor will perform the work in compliance with these specifications. The work plan shall include information on preparation of the work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. It will also list decontamination procedures for personnel, work area and equipment, removal methods and procedures, required air monitoring program, procedures for handling and disposing of waste materials and procedures for final decontamination and cleanup.

Worker - A person who successfully meets the training requirements for the disturbance of lead as described in these specifications.

8 CCR 1532.1 - Chapter 8 of the Labor Code, California Code of Regulations, Section 1532.1: Lead (Known as the Lead Standard for the Construction Industry)

8 CCR 1544 - Chapter 8 of the Labor Code, California Code of Regulations, Section 1544: Respiratory Protection Standard.

1.3 Regulatory Compliance

Various agencies regulate work that disturbs lead-containing materials. The following is a summary of the most important agencies and regulations that apply during the disturbance of lead during construction work. This list is not to be considered comprehensive. The Contractor is responsible for complying with all applicable federal, state, and local regulations that may apply to the specific work they are conducting.

1.3.1 Environmental Protection Agency (EPA)

Lead: Identification of Dangerous Levels of Lead; Final Rule (40 CFR Part 745 Subpart D)

The EPA defines lead-based paint as paint and coatings that contain lead in concentrations equal to

or more than one milligram per square centimeter (1 mg/cm^2), 5000 parts per million (5000 ppm), or one half of one percent (0.5%) by weight. EPA regulations apply to all housing and child-occupied facilities built before 1978. When the term "lead-based paint" is used in the context of these specifications, the term is used only to refer to paint that contains lead in concentrations equal to or greater than that defined by the EPA as lead-based paint. (This is to differentiate lead-based paint from the term "lead-containing paint" as used for compliance with Cal/OSHA.)

1.3.2 Housing and Urban Development (HUD)

Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance (24 CFR Part 35)

The HUD Rule for Federal Housing (shortened name) applies to all residential properties built before 1978 that receive Federal financial assistance. This regulation uses the same definition of lead-based paint as the EPA. The work practices and procedures described in these specifications are designed to comply with occupant and worker protection regulations as mandated by OSHA and Cal/OSHA regulations for work that disturbs lead and **are not** designed to comply with all the requirements of 24 CFR Part 35. Should this project be covered by this regulation, the Owner may require additional practices and procedures in the scope of work for activities conducted in properties covered by the HUD Rule for Federal Housing.

1.3.3 California Department of Public Health (CDPH)

Accreditation, Certification, and Work Practices For Lead-Based Paint And Lead Hazards (Title 17, CCR, Division 1, Chapter 8, Sections 35000-361000)

This regulation primarily applies to residential and public buildings located in California. The definition of a public building is one that is "generally accessible to the public." Some aspects of this regulation, particularly those that pertain to the definition of "presumed lead-based paint" and the containment requirements for disturbing lead-based paint **apply to all structures** in California.

This CDPH regulation definition of lead-based paint is identical to the EPA/HUD definition of 1 mg/cm^2, 5000 ppm, and 0.5% by weight. In addition, this regulation requires all paint on structures in California to be treated as "presumed lead-based paint" unless the paint is on a home built after 1978 or a Owner built after 1992. Therefore, the paint in all owner's buildings covered by this project that were constructed before 1993 must be treated as lead-based paint unless tested and proved otherwise as described elsewhere in these specifications.

The CDPH regulation differentiates between work that disturbs lead as part of renovation or maintenance work and work that disturbs lead as part of "abatement" work as defined in Title 17. The work practices and procedures described in these specifications are designed to comply with occupant and worker protection regulations as mandated by Cal/OSHA regulations for work that disturbs lead as part of renovation, demolition, and maintenance work. These specifications are not designed to comply with the requirements for abatement as defined in the CDPH Title 17 regulation. Unless stated specifically otherwise in these specifications, the Owner does not anticipate any work being done as part of this project that meets the definition of abatement as used in Title 17. Therefore, unless specifically directed otherwise by this specification or by the direction of the Owner and/or Project Monitor, the Contractor and/or subcontractors shall NOT submit Form 8551, "ABATEMENT OF LEAD HAZARDS," to the CDPH since that form provides inappropriate notice for the work done on this project. The Contractor may be required to complete and submit this form should the scope of the work or the work practices change.

This regulation has significant penalties associated with the creation of "lead hazards." Lead hazards are defined as: "...disturbing lead based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure." The requirements

discussed in Part 3.5 Work Site Preparation & Containment Requirements are designed to meet CDPH requirements. Should a Contractor and/or subcontractor conduct work without a containment or release lead-contaminated dust or debris outside of the containment, they are in violation of this regulation. The Project Monitor will stop all work, consider the Contractor and/or subcontractor to be in violation of these specifications and the contract documents. Work will not be allowed to begin again until the Contractor and/or subcontractor takes adequate steps to correct their violation and convinces the Owner and/or Project Monitor that the violation will not occur again.

1.3.4 California Division of Occupational Safety and Health Administration (DOSH)
Lead Standard for the Construction Industry (8 CCR 1532.1)

This standard regulates work done by employees who may disturb lead as part of demolition, construction, renovation or maintenance work. Painting activities that may disturb lead are covered by this standard. General construction work that disturbs lead is covered, as is the demolition of building components or entire structures.

Cal/OSHA regulates lead whenever lead is determined to exist in a material. When the term "lead-containing paint" is used in the context of these specifications, the term is used to refer to paint that contains lead in an amount equal to or above the reporting limit for the laboratory analysis or that detected by an X-ray Fluorescent Analyzer (XRF).

In addition, Cal/OSHA uses the EPA/HUD/CDPH definition of lead-based paint (1.0 mg/cm^2, 5000 ppm, or 0.5% by weight) for their pre-job notification requirements discussed in Part 1.4 Lead-Work Pre-Job Notification Requirements.

The following information summarizes the significant requirements in the Cal/OSHA standard. This summary is not meant to substitute for the Contractor reading and being familiar with the Cal/OSHA requirements.

a. The Cal/OSHA lead standard is very complex. Cal/OSHA regulates lead in materials when a laboratory can quantify the amount of lead. This means materials are regulated even when they contain very small amounts of lead. The standard sets an "Action Level" for airborne lead at or above 30 $\mu g/m^3$ over an eight-hour-time-weighted average. Typically, if employees are expected to be exposed to this airborne lead level, the employer must conduct air sampling, provide blood lead testing, and provide specialized training. The standard sets a "Permissible Exposure Limit" or "PEL" for airborne lead at or above 50 $\mu g/m^3$ over an eight-hour-time-weighted average. The employer must continue the requirements needed at the Action Level but must now provide respirators, protective clothing, a shower decontamination system, and a written compliance program.

b. In 8 CCR 1532.1 (p), employers are required to notify Cal/OSHA before employees conduct a trigger task that will disturb more than 100 square or linear feet of material that contains lead in concentrations equal to or above 1.0 mg/cm^2, 5000 ppm, or 0.5% by weight. The notification also applies to welding or torch cutting that takes more than one hour in a shift. Trigger tasks are described in 8 CCR 1532.1 (d)(2). In brief, they include manual demolition, scraping, sanding, using HEPA-attached equipment, using heat guns to remove lead paint, welding, torch cutting, and using other more aggressive techniques. This is a summary list and does not list all task that are considered trigger tasks.

c. The California standard defines lead-containing paint at the Consumer Product Safety Commission's (CPSC) level of 0.06% by weight or 90 ppm for non-trigger tasks. The lead standard would not apply if the paint contains less than 90 ppm and the employees do not conduct trigger tasks. However if the employees do conduct trigger tasks, the entire

standard applies.

d. Cal/OSHA requires CDPH lead training and certification for any supervisors or workers who are "shown to be exposed" to airborne lead levels above the PEL in residential or public buildings. The Owner and Project Monitor/Project Supervisor believe that there is a reasonable expectation that those workers scraping paint prior to repainting, and those demolishing ceramic tile are likely to be exposed over the PEL. Therefore, on this project, that work must be done by CDPH certified workers and supervisors.

e. Cal/OSHA requires the supervisor to establish a "regulated area" whenever employees may be exposed to airborne lead over the PEL or if they will perform trigger tasks as defined in 8 CCR 1532.1 (d)(2). The establishment of regulated areas is discussed in Part 3.5 Work Site Preparation & Containment Requirements.

1.4 Lead-Work Pre-Job Notification Requirements

The Contractor is responsible for complying with the Lead-Work Pre-Job Notification as specified in 8 CCR 1532.1 (p). If notification is required for this project, the Contractor must provide the notification to Cal/OSHA and provide a copy of this notification to the Owner and/or Project Monitor as part of the Contractor's pre-work submittal package.

Unless the material is tested as described elsewhere in these specifications, the Contractor and subcontractors must anticipate notifying Cal/OSHA if they plan to manually demolish or perform another type of trigger task (such as paint scraping or sanding) on any painted surface or ceramic wall surface on this project if the amount of material to be disturbed equals or is greater than 100 square feet.

Notification to Cal/OSHA is not required if the paint on the painted surface is primarily intact (not loose and peeling) and the painted material is removed in a manner that does not disturb the paint. For example, door or window frames may be removed without providing the notification if the paint or coating on the frames is intact and the building components can be removed without significantly disturbing the coating.

Unless stated otherwise in these specifications, or directed otherwise by the Project Monitor/Project Supervisor, the Contractor and/or subcontractors shall NOT submit Form 8551, "ABATEMENT OF LEAD HAZARDS," to the CDPH since that form provides inappropriate notice for the work done on this project since no lead "abatement" as defined by CDPH will be conducted as part of this project.

1.5 Lead Training Requirements

At a minimum, the Contractor and subcontractors must meet the lead training requirements as specified by 8 CCR 1532.1. This will include training all employees who drill, cut, scrape, abrade, remove, clean up debris, or in any other way are exposed to lead from painted surfaces or ceramic tile found on the buildings or structures covered by this project. The different types of training are summarized below for the typical types of work that are expected to disturb lead on this project.

1.5.1 Minimal Training Required For All Workers Exposed To Lead

This training will be sufficient for those who disturb lead in only minor ways. Those disturbing lead in more significant amounts will need to meet the training requirements stated in Part 1.5.2 or 1.5.3.

For example, this training applies to those workers who, for a total of less than one hour in an eight- hour shift, will drill or cut through painted surfaces, remove painted components (when the paint is intact), or remove ceramic tile significantly intact. *(This time frame is guidance and not an official Cal/OSHA time frame. This time frame is suggested because it is thought that these tasks, done for*

such a short time frame, do not pose a realistic chance that workers will be exposed over the Action Level based on an eight-hour time-weighted average.) In some cases, however, depending on the surface and type of work being conducted, the Project Monitor may determine that more training is needed even if the worker disturbs lead for less than an hour. In general, workers with this training conducting this type of minimal disturbance of lead will not need to wear respirators while conducting this work.

The training must comply with the training requirements as listed 8 CCR 1532.1(l)(1)(A). In summary, this training must comply with Hazard Communication Training for lead as discussed in 8 CCR 5194. This training is also known as "hazard communication," or "lead awareness" training and is usually done in less than hour depending on the work the employee will conduct.

The Contractor and subcontractors will need to provide the Owner and/or Project Monitor written proof that this training has been provided before workers will be allowed to conduct work that disturbs lead even in minimal amounts.

Proof of this training is not required if the employees are trained to the levels listed in Part 1.5.2 and/or 1.5.3.

1.5.2 Required Training For Those Exposed Over the Action Level Or Who Conduct Trigger Tasks

This training must be done for all those workers who conduct trigger tasks or are expected to be exposed above the Action Level. Typically, this training will be required for workers who conduct a trigger task such as paint scraping or manual demolition of painted components and the work will take more than one hour in an eight-hour shift. (This is a guidance and not an Cal/OSHA time frame.) The Project Monitor may determine that this training is needed for some workers who conduct tasks for even less than an hour.

The training must comply with the training requirements as listed 8 CCR 1532.1 (l)(1)(B) and (l)(2)(A- H). In summary, the standard requires the worker to be trained in series of subjects. The length of training depends on the experience and previous training of the worker, the type of work they will conduct, and whether or not they already have been trained and approved to wear respirators. Workers receiving this training and conducting this type of work will typically need to wear respirators and protective clothing while they conduct the work.

An environmental contractor, or a contractor with environmental work experience, previous training, and a written respiratory protection program generally conducts this type of work. The Owner and Project Monitor do not recommend subcontractors attempt this type of work. However, subcontractors will be allowed to conduct this type of work on this project if they can demonstrate proof of training and carry out the work according to these specifications.

The Contractor and subcontractors will need to provide the Owner and/or Project Monitor written proof that this training has been provided all workers conducting the tasks that require this training.

This training is not required if the employees are trained to the levels listed in Part 1.5.3.

1.5.3 Required Training For Those Who Are Reasonably Expected To Be Exposed Over The PEL And/Or Conduct Trigger Tasks On Over 100 Square Feet of Material

Workers and supervisors must be CDPH Certified Lead-Related Construction Workers, Supervisors if they will conduct trigger tasks, or other work reasonably expected to exceed the PEL and/or conduct this work on over 100 square feet of material. *(This is a guidance amount and not a Cal/OSHA regulatory requirement. However this amount of material and type of work is reasonably*

expected to potentially release airborne exposures over the PEL and thus trigger the CDPH certification requirement.) This includes work such as the manual demolition of painted surfaces, ceramic walls, paint

preparation work (sanding and scraping), and other tasks as described in 8 CCR 1532.1 (d)(2). Proof of training will be a currently valid CDPH certification card. Workers who can show a completed course completion form and a completed application form for certification will be allowed to work pending their being fully certified.

Exception: Licensed asbestos contractors performing paint scraping work on the outside of buildings only for the purpose of removing loose and peeling paint prior to the demolition of the building, or the demolition of a structure, will not be required to have the workers or on-site supervisor be CDPH certified. They must, however, show proof of training in compliance with 8 CCR 1532.1 (l)(2) for employees who may be exposed above the Action Level. In summary they must meet the training requirements of this specification as stated in Part 1.5.2. In addition, however, the Contractor must have a CDPH certified supervisor approve the containment setup at the start of each shift that will disturb lead, approve the work practices and personal protective equipment worn by the workers, verify that proper air monitoring is being collected, must be able to return to the site within two hours if requested by the Project Monitor, and must approve the final cleanup of the work area prior to a visual inspection of the work area being conducted by the Project Monitor. The certified supervisor will always be required to approve the initial set up of the containment, personal protection, and work practices at the start of the job, but then depending on the quality of the work demonstrated, the Project Monitor may not require the certified supervisor to inspect the work site at the start of each shift. This exemption will be revoked should air sampling on this project demonstrate airborne lead levels above the Action Level on workers or supervisors.

1.6 Required Submittal Documents

While additional documents may be required by the scope of work for this project, at a minimum, the Contractor will be required to provide the Owner and/or Project Monitor with the following documents regarding the Contractor's ability to safely disturb lead-containing materials.

1.6.1 Submittals Prior To The Start Of Work

All Contractors and subcontractors who will have employees disturb lead on this project must, at a minimum, provide proof of item number 1.6.1.e.1., lead hazard communication training in compliance with 8 CCR 1532.1 (l)(A)(1). This is the only submittal that must be provided by these employers as long as they do not disturb conduct more disturbance of lead than is described in Part 1.5.1.

The following submittals must be provided by all Contractors and subcontractors who will, at a minimum, have employees who will conduct trigger tasks for more than one hour per shift, will potentially be exposed above the Action Level, or will conduct other activities as determined by the Project Monitor that may result in significant exposure to lead.

a. A written lead compliance plan in compliance with 8 CCR 1532.1 must be provided that includes the following:

   1. A description of equipment and materials, controls, crew size, job responsibilities, and operations and maintenance procedures for each activity in which lead is disturbed and potentially emitted;

   2. A description of specific control methods (wet methods, engineering controls, etc.) that will be used to ensure workers are not exposed above the PEL;

   3. Technology considered in meeting the Cal/OSHA permissible exposure level (PEL);

   4. Air monitoring data documenting sources of lead emissions;

   5. A detailed implementation schedule for the compliance plan, including the schedule for inspections by a competent person;

6. A description of the lead work practice program, which will be used to control worker exposures. This includes the use of protective work clothing, equipment, hygiene facilities and practices, and housekeeping practices;

7. A description of the steps the Contractor or subcontractor will take to minimize the generation of hazardous waste produced on this project. This includes, but is not necessarily limited to how the contractor will separate waste streams. For example, how will the Contractor or subcontractor keep potentially hazardous waste such as paint chips and dust from being disposed of with other potentially non-hazardous construction materials and debris?

Note: If a Contractor or subcontractor is found conducting lead-related work not specifically mentioned and described in the compliance plan, the work will be stopped until a compliance plan including that work is submitted, reviewed, and approved by the Owner and/or Project Monitor.

b. Copy of the Contractor or subcontractor's written respirator program in accordance with the requirements of 8 CCR 1544.

c. Proof that all employees expected to wear respirators on this project have medical approval to wear a respirator.

d. Copies of respiratory fit-tests for all workers expected to wear a respirator on this project. Fit testing must be done as required by and in accordance with 8 CCR 1544.

e. Proof of training required by Part 1.5 for type of work employee will do.

1. Proof of Hazard Communication Training for Lead done within the last calendar year for those exposed to lead or who will perform trigger tasks for less than one hour. *(Proof may be a certificate or written statement stating training was completed and a list of names of those individuals who were trained. Proof of this training is not needed if employee provides proof of training required by items e. 2, or e 3.)*

2. Proof of training in compliance with 8 CCR 1532.1 (l)(2) done within the last calendar year for all employees who will conduct trigger tasks as defined in 8 CCR 1532.1 (d)(2) for more than one hour or who will reasonably be expected to be exposed to lead above the Action Level. *(Proof may be a certificate or written statement stating training was completed and a list of names of those individuals who were trained.)*

3. Proof of CDPH lead certification for those workers who will conduct trigger tasks as defined in 8 CCR 1532.1 (d)(2) or will reasonably be expected to be exposed to airborne levels of lead above the PEL on projects that will disturb more than 100 square feet of lead-containing material. *(Proof of certification will be a currently valid CDPH certification card as a worker or supervisor. Workers who can show proof of a valid course completion form and application being submitted to CDPH, will be allowed to work while awaiting full certification from CDPH.)*

4. Proof of current CDPH certification as a lead supervisor for the on-site competent person for projects involving the conduction of trigger tasks or other activities reasonably expected to exceed the PEL on all projects that will disturb more than 100 square feet of lead-containing material. *(Proof of valid certification will be a currently valid CDPH certification card a worker.)*

5. If exception to requirement for CDPH certified supervisor listed in Part 1.5.3 is requested, then provide proof of CDPH certified supervisor who will verify containment, personal protection and work practices, and will be able to respond to the project within two hours of request by the Project Monitor.

f. Copies of all current SDS for chemicals used on this project.

g. Manufacturers' certifications that high efficiency particulate air (HEPA) vacuums, pressure differential units and other local exhaust ventilation equipment conform to ANSI Z9.2-79 for all HEPA-filtered equipment that will be used on this project. *(This is proof that the equipment is actually HEPA filtered. This is separate from the challenge testing requirement needed for equipment used in interior spaces.)*

h. Name and contact information of independent testing company who will challenge test all vacuums and air filtration devices used on this project (in interior spaces).

I. Statement regarding compliance with all Cal/OSHA exposure monitoring required for this project.

j. Name and contact information for laboratory who will analyze air samples or waste samples and documentation of their certification to conduct such analysis.

k. Name of Waste Transporter who will transport hazardous waste on this project and documentation that the Transporter is allowed to transport lead hazardous waste.

l. Name of Waste Landfill to which lead hazardous waste will be sent and documentation that such landfill is allowed to accept such waste.

m. Should waste water filtration be required on this project, submit manufactures documentation pertaining to the capability of waste water filters to filter particles of, at a minimum, five micrometers in size.

n. List of all rented equipment to be used within a lead regulated area, or a statement that no rental equipment will be used on this project.

1. If rental equipment is to be used, submit written statements from each rental company indicating the rental company's acknowledgment that the equipment is provided for and may be used in areas where airborne levels of asbestos and/or lead may be present.

o. Submit emergency plans. At a minimum submit the following:

1. Submit non-emergency telephone numbers, other then 911, for the appropriate Police, Sheriff, and Fire Departments.

2. Name, pager or cell phone numbers of the on-site supervisor and his immediate company supervisor.

3. Submit detailed written directions from the project site to the medical facility to be

used in case of an emergency. Also include a map which sufficiently shows the route to be taken from the site to the designated medical facility.

4. Submit written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

p. Local sanitation district Wastewater Discharge Permit for Surface Washers (if required).

q. Cal OSHA Notification. This is required for this work on all projects that will disturb more than 100 square feet of lead-containing material.

The above listed documents must be provided prior to the start of work that will disturb lead. Under no circumstances will workers or supervisors be allowed to work on this project prior to the receipt, review, and acceptance of this documentation by the Owner and/or Project Monitor. In addition, documentation for rental equipment must be provided before the equipment may be used in a lead regulated area. All delays resulting from the failure of the Contractor and/or subcontractors to provide this information in the required time frame is solely the responsibility of the Contractor and/or subcontractor.

The Contractor must use the Pre-Work Submittal Checklist provided at the end of these specifications to provide the Owner and/or Project Monitor these submittals. Failure to use the form will likely lead to the rejection of the submittal package and a delay in the project that will be the sole responsibility of the Contractor and/or subcontractor.

The Contractor is responsible for maintaining current documents and resubmitting copies to the Owner and/or Project Monitor for any worker whose documents expire during the project. Any worker observed on a job site who either is not approved to conduct work by the Owner and/or Project Monitor or has been approved but documentation pertaining to training, medical evaluation, or respiratory fit testing has expired, will be instructed to stop work until these documents are received by the Owner and/or Project Monitor and the worker is approved to perform work that disturbs lead.

1.6.2 Submittals Provided During The Work Or Following Completion Of The Work If Applicable

Depending on the document, these documents must be provided the Owner and/or Project Monitor on an ongoing basis during the work, or if appropriate following completion of the physical activities associated with the project. The documents must be received and approved by the Owner and/or Project Monitor before the work is considered complete. (Failure to provide these documents means the work is not complete, even though the physical activities may be completed.)

a. Daily sign-in sheet for each worker entering a lead regulated area.

b. The Contractor must provide the results of exposure sampling done to comply with the requirements of 8 CCR 1532.1 (d) and the requirements of this specification.

c. The Contractor must provide blood sampling and analysis results of lead (BLL) and zinc protoporphyrin (ZPP) levels for all workers who are represented by air monitoring results that exceed the Action Level. Typically, the Project Monitor will require blood lead sampling for all workers on a work shift if one or more air sampling results for that shift is above the Action Level.

d. The written results of the blood sampling analysis must be provided the Owner and/or Project Monitor within 21 days of the exposure over the Action Level or within 12 days of the completion of the project, whichever comes first.

e. Copies of job progress reports and project documentation. This must include the names of all employees onsite, the hours worked and a brief description of the work completed at the site(s).

f. The Contractor must provide all waste disposal documentation.

1.7 Third-party Oversight

The Owner is utilizing the services of Atlas as an independent third-party consultant to provide oversight of all work that disturbs lead on this project. The Contractor shall treat this third-party consultant as a designated representative of the Owner. The third-party consultant for this project is known as the Project Monitor. The Project Monitor is expected to perform some or all of the following activities on this project, but may also conduct other activities as needed:

a. Visually monitor the work practices of the Contractor's employees to determine that the work is being done in compliance with these specifications. The Project Monitor may conduct this activity on a continual basis or may make unannounced random visits to the project site to check on the Contractor's performance.

b. Visually inspect for the presence of visible emissions suspected to contain lead.

c. Conduct personal and area air monitoring in accordance with accepted methods.

d. Collect bulk samples of relevant materials to determine the presence or absence of lead.

e. Visually inspect the work area for cleanliness after completion of the work.

1.8 Air Sampling By The Owner and/or Project Monitor

The Owner and/or Project Monitor may determine it appropriate to collect air samples to evaluate the effectiveness of the Contractor is engineering controls and work practices. The Contractor and/or subcontractors shall allow the Project Monitor to attach and collect personal air samples on the workers and shall instruct the workers to comply with the directions for that sampling as given by the Project Monitor.

Air sampling may also be used to verify the effectiveness of the Contractor's containment system. The Project Monitor may choose to collect area air samples within the work area. These samples results may be used to generate an eight-hour, time-weighted average. The result of area samples in a lead work area should normally be far below what the workers are breathing. Therefore should the Project Monitor collect area air samples within the work area that result in exposures above half the Action Level (15 $\mu g/m^3$), the Project Monitor will require the Contractor and/or subcontractors to re-evaluate their work practices, engineering controls, and containment system.

The Project Monitor may also choose to collect area samples downwind, outside of the regulated work area. These sample results will be compared to background air samples upwind or samples collected prior to the beginning of work. Sample results indicating airborne lead emissions at or above 5 $\mu g/m^3$ above background levels will be interpreted to mean that the Contractor and/or subcontractors containment or engineering controls are inadequate. This may result in the temporary stoppage of work until the Project Monitor is assured that airborne lead levels will significantly diminish by the change in work practices or engineering controls.

1.9 Notification of Employers of Employees in Adjacent Areas

The Contractor and subcontractors who will disturb lead are responsible for ensuring that employers of employees in areas adjacent to the work being conducted have been notified that work disturbing lead will take place.

Typically this notification is in addition to the posting of lead regulated area signs. In summary, this notice shall be provided to all other contractors and subcontractors in areas adjacent to the work. Those employers must be notified in advance of any upcoming work that will disturb or impact lead in a manner that may generate airborne levels of lead that could present a potential exposure to workers at or above the Permissible Exposure Limit (PEL) as defined in 8 CCR 1532.1©. This notice shall also provide information on the control measures being implemented and a warning that the employer's employees are to remain outside of the posted regulated areas. The Contractor and/or subcontractors anticipating the need for such notification shall coordinate this notification with the Owner and/or Primary Contractor.

1.10 Suspension Of Work

The Owner and/or Project Monitor may suspend all work that disturbs lead if any controls (such as barriers) fail, if debris known or suspected to contain lead is detected outside the containment, or if work is on the exterior of a structure and wind speeds are more than fifteen miles per hour, or if in the judgement of the Project Monitor, other factors exist that determine the work must be stopped because of the potential for the creation of lead hazards. For example, the Project monitor may conduct perimeter monitoring and discover that lead is being released in concentrations at 5 µg/m^3 above background levels or work area air monitoring that is above half the Action Level. In either case, the Owner and/or Project Monitor may suspend work until more effective containment, work practices, and engineering controls are utilized.

1.11 Pre-Start Meeting

The Project Monitor typically recommends that there be a pre-start meeting with the Contractor or subcontractor's representative and the Project Monitor approximately five days prior to the expected start of work. The Contractor will be expected to provide the majority of pre-work submittals described in Part 1.6.1 at that meeting. This meeting is designed to answer questions about the project and address issues of concern of either the Contractor, subcontractor, or Project Monitor. Should this meeting be determined not to be necessary, the submittals must be delivered to the Owner and/or Project Monitor no later than five working days in advance of the work.

1.12 Testing For Lead In Paints, Coatings, Ceramic Tile, And Other Materials

Lead is common in the paint and ceramic wall tile in buildings the age of buildings on this project. Therefore, it is not anticipated there will be a need for additional testing. However, in some cases, it may be in the interest of the contractor and/or subcontractors to determine the exact concentration of lead in the paint or coating since that will affect Cal/OSHA and CDPH compliance issues. For example, many interior surfaces will contain paint, which contains less than 600 parts per million lead. Should the paint be tested and that discovered, much of the Cal/OSHA lead standard and not all of the CDPH Title 17 standard will apply.

For example, should the paint contain less than 600 parts per million lead, the contractor and/or subcontractors could drill into or conduct other non-trigger tasks on this material without extensive training. Also, the demolition of these surfaces would not trigger prior notification to Cal/OSHA.

Should the contractor and/or subcontractor wish the paint or ceramic tile to be tested, they will need to request this of the Project Monitor. This testing must be done by Atlas. The Project Monitor will be able to assist the contractor and/or subcontractor in determining if testing the material is likely to be worthwhile for the contractor and/or subcontractor.

PART 2.0 MATERIALS AND EQUIPMENT

2.1 Fire Resistant Plastic Sheeting (Poly)

All plastic sheeting used on this project must be fire resistant whether used inside or outside of buildings.

2.2 Challenge Testing Of HEPA Filtration Systems

All HEPA-equipped vacuums and air filtration units to be used on this project in interior spaces during operations that may disturb lead must be challenge tested and meet ANSI requirements using DOP or an equivalent testing agent. Except for HEPA air filtration units used to create negative pressure differentials for the demolition of ceramic tile, this testing must take place within ten calendar days prior to their use and after replacement of any HEPA filter removed from previously tested equipment. Air filtration units used in conjunction with the demolition of ceramic walls must be challenge tested on site. They do not need to be retested as long as they remain on site. They will need to be retested if they are moved off site. Copies of all testing certifications must be provided to the Owner and Project Monitor prior to use of the equipment.

Exception: Subcontractors using HEPA vacuums for incidental cleanup of lead dust resulting from the minimal disturbance of lead as discussed in Part 1.5.1 are exempt from the challenge-testing requirement unless, in the judgement of the Project Monitor, there is a reasonable expectation that the subcontractor's HEPA vacuums are leaking.

2.3 Vacuum-Assisted Tools

When using power tools to disturb lead, the Contractor shall only use tools that have a HEPA-filtered-vacuum recovery system.

2.4 Power Washing

No high pressure or water blasting tools may be used if the spray will contact lead-containing paint.

For the purposes of this specification, power washing is defined as: The use of a low pressure "power washer" to rinse and/or wash stable, painted or coated surfaces to remove dust, dirt, grime, and other foreign matter in preparation for re-painting." Under no circumstance may power washing be used to remove lead-containing paints or coatings from surfaces. Before using power washing, all areas of loose, peeling, cracking,

or unstable coatings must first be prepared for re-painting using the appropriate methods and personnel protective equipment as specified by Cal/OSHA and CDPH regulations, and these specifications. Typically, this means all loose and peeling paint must be removed by hand scraping and sanding or the use of mechanical tools equipped with HEPA filtration.

Should a Contractor or subcontractor use power washing in a manner that releases paint from the surface, and that paint also not be contained, the Contractor or subcontractor will be responsible for all costs associated with the Owner hiring and environmental contractor to clean up the area. The area to be cleaned will be determined by the Project Monitor and will extend past the point of visually apparent debris.

Prior to performing power wash operations the Contractor must determine if the local sanitation district requires a Wastewater Discharge Permit for Surface Washers. Should this permit be required, the Contractor is responsible for obtaining it, accurately completing it and adhering to the permit requirements.

2.5 Personal Protective Equipment

The Contractor shall use respirators and personal protective equipment as required by 8 CCR 1532.1 and as appropriate based on personal air monitoring results. All respirators must be approved by NIOSH.

Respirator fit test records and the respiratory protection program shall be retained on site as part of the project documentation if respiratory protection is used on this project. Disposable dust/mist respirators shall not be used.

At a minimum, half-face respirators with P-100 (HEPA) cartridges will be required during surface preparation where there is manual scraping or sanding that will take more than one hour to complete. Dry scraping or sanding, mechanical scraping, abrading, sanding, or similar actions will trigger the need for respirators regardless of the duration of the activity.

Regardless of the duration of the work, all workers scraping lead-containing paint or removing or demolishing ceramic tile must wear disposable protective clothing. Workers demolishing surfaces that contain ceramic tile must wear full body protective clothing including hoods and gloves.

At a minimum, the Contractor and subcontractors must ensure that no lead dust or debris is tracked out of the contained, regulated area. The Contractor and subcontractors must ensure that all those allowed into the regulated area wear adequate foot coverings that ensure that they will not track contaminated material out of the area when the leave.

2.6 Rental Equipment

Any equipment rented for the purpose of disturbing lead or used within a lead regulated area must be accompanied with documentation verifying that the rental agency has been notified, and acknowledges receipt of notification that the equipment being rented will be used for work inside a lead regulated area. This documentation must be submitted to the Project Monitor/Project Supervisor prior to the equipment being used on the job site.

PART 3.0 EXECUTION

3.1 Summary

Contractors and subcontractors conducting lead related construction work will be evaluated on a performance standard, which includes, but is not limited to, cleanliness of work area, work practices as verified by exposure monitoring, containment set up, and ultimately, the cleanup of paint chips, dust, and debris.

Any work practice that creates paint chips, dust, glazed ceramic or painted debris must be conducted within a regulated area as defined in 8 CCR 1532.1 and within a containment at least as stringent as required by Title 17 and/or described in these specifications.

The containment system shall be designed and constructed to prevent visible dust or debris from escaping the work area as well as the escape of airborne lead emissions at or above 10 µg/m^3 above background levels. Should dust or debris generated by the work be found outside the containment, or the airborne lead outside the containment exceed background levels, the Project Monitor will determine that the containment is inadequate, in violation of Title 17 requirements, and work will be stopped until the Contractor and/or subcontractors redesign the containment to be more effective.

3.2 PEL and Action Level Compliance Requirements

Contractors and subcontractors strictly adhering to the requirements listed in the specifications who conduct minimal disturbance of lead such as by the conduction of trigger task work amounting to less than one hour, may begin work assuming the Cal/OSHA Permissible Exposure Limit (PEL) will not be exceeded.

Contractors and subcontractors not strictly conforming to suggested work practices must start work assuming the PEL will be exceeded. This means they must comply with all OSHA requirements specified for work that results in exposures over the PEL. This will include, but is not limited to, complying with requirements for training, personal protection, regulated area development, blood testing, personal air monitoring, the development of a written compliance plan, and the notification of employers in adjacent areas.

Contractors and subcontractors must assume the PEL will be exceeded each time they conduct trigger activities that will exceed one hour in duration. This will trigger the need to wear respirators and protective clothing, meet the training requirements specified earlier in these specifications, conduct personal air sampling, develop a written compliance plan and all other actions described as necessary by 8 CCR 1532.1 and these specifications.

3.2.1 Personal Air Sampling

The Contractor and subcontractors are responsible for conducting personal air monitoring during disturbance of lead in compliance with the requirements of 8 CCR 1532.1. At a minimum, Contractors and subcontractors shall conduct representative exposure monitoring on workers on a daily basis whenever those workers will conduct trigger task activities that will take longer than one hour to complete in an eight-hour shift. In addition, air sampling must be done for any work for which the Project Monitor believes has a reasonable potential for generating airborne lead at or above the Action Level. The Project Monitor will not allow work to proceed if the Contractor is not prepared to conduct the necessary air monitoring.

Sample information must include (but is not restricted to) the name of the individuals wearing the samples, the individuals' Social Security Number or Company ID number, the date the samples were collected, identification by unique method of the area where the work is being performed, and identification of the work being performed. EXAMPLE: James Black, 000-11-222, 06/25/03, Bill Jackson Elementary Owner, Building H, Classroom 5, East covered walkway, paint surface preparation work.

Laboratory results shall be provided to the Owner and/or Project Monitor within 72 hours of sample collection. Paper copies must be received within 14 days of the Contractor receiving the results from the laboratory. Contractor and/or subcontractor must submit proof that laboratory has the required licenses to analyze air samples for lead.

Should they wish to make use of the exceptions to air sampling stated in 8 CCR 1532.1 (d)(3)© & (D), the Contractor and/or subcontractors must submit the required information to the Owner and/or Project Monitor and receive written approval from the Owner and/or Project Monitor prior to reducing the personal protection, containment, or engineering controls stated in this specification. In general, air sampling results that are intended for use to reduce personal protection requirements must be collected on this project. Air sampling results from other projects will not be allowed to create a negative exposure assessment for use on this project.

Contractor and/or subcontractors must submit a signed statement that they will conduct personal air sampling according to Cal/OSHA requirements for all work where that sampling is required by these specifications. Typically sampling will be required whenever the Contractor and/or subcontractor conduct a trigger task for more than one hour in an eight or more hour shift.

3.3 Work Involving Whole Component Removal or Demolition Of Entire Structures

Intact lead-containing paint on construction debris is generally not considered a hazardous waste in California. However, loose and peeling paint on structures may result in all construction debris from that site being considered a hazardous waste.

Therefore prior to the demolition or removal of painted material and the disposal of that material, all loose, peeling or flaking paint must be removed. This includes objects such as fences, built-in furniture or cabinets, other similar structures, as well as entire structures being demolished.

Any paint debris generated during this work must be separated into appropriate waste streams and handled as a hazardous waste, or as deemed appropriate as discussed in Part 3.11 Lead Waste Management.

The manual demolition or removal of painted components involving over 100 square feet of material does not trigger the Cal/OSHA pre-work notification as stated in 8 CCR 1532.1 (p) if the paint is intact and will largely remain undisturbed by the removal or demolition process. For example, if door or window frames with intact paint are removed, and the amount of material is over 100 square feet, the Cal/OSHA notification does not need to be provided if the paint is intact and will not be disturbed by the removal process.

3.4 Prohibited Work Practices

The following work activities are prohibited on the project:

a. Open-flame burning or torching.

b Machine sanding or grinding of lead materials or surfaces coated with lead unless the machine is equipped with a HEPA-filtered-vacuum recovery system.

c. Un-contained hydro-blasting or high-pressure washing.

d. The use of power washing to remove loose and peeling paint.

e. Abrasive blasting or sandblasting without a HEPA-filtered-vacuum recovery system or done outside of a negative pressure enclosure.

f. Heat guns operating above 1,100 ˚F.

g. Dry scraping, except for limited areas where electrical hazards create a higher risk than lead or unless specifically approved by the Project Monitor.

h. Use of methylene chloride based paint strippers.

3.5 Competent Person

The Contractor and/or subcontractors disturbing lead shall have a competent person (as defined by Cal/OSHA for construction activities) onsite at all times to supervise and oversee all activities, which may disturb materials containing lead. This person must be a CDPH Certified Lead Supervisor for all work that involves the conduction of trigger tasks on more than 100 square feet of lead-containing material.

The above requirement is not required for environmental contractors conducting work limited to the removal of loose and peeling paint on structures scheduled for demolition. In those situations, the on-site supervisor must meet the lead training requirements as stated in Part 1.5.2 Required Training for those exposed over the Action Level or who conduct trigger tasks. In addition, the Contractor must have a CDPH certified supervisor approve the containment setup at the start of each shift that will disturb lead, approve the work practices and personal protective equipment worn by the workers, verify that proper air monitoring is being collected, be able to return to the site within two hours if requested by the Project Monitor, and approve the final cleanup of the work area prior to a visual inspection of the work area being conducted by the Project Monitor. *The certified supervisor will always be required to approve the initial set up of the containment, personal protection, and work practices at the start of the job, but then depending on the quality of the work demonstrated, the Project Monitor may not require the certified supervisor to inspect the work site at the start of each shift.* This exemption will be revoked should air sampling on this project demonstrate airborne lead exposures to workers or supervisors are above the Action Level.

Altadena Library

3.6 Work Site Preparation & Containment Requirements

The Contractor and/or subcontractor is required to contain the disturbance of lead in a manner that prevents lead-contaminated dust, debris, water, or air from leaving the regulated work area in an uncontrolled fashion. The containment must be developed in compliance with the requirements of Title 17 and these specifications. The presence of lead dust, debris, or air above background levels will indicate that the containment is inadequate. Work will be stopped and the Contractor and/or subcontractor must adjust work practices, engineering controls, or the containment in a manner that convinces the Project Monitor/Project Supervisor that the material will no longer be able to escape the regulated work area.

3.6.1 Exterior Work Site Preparation & Containment

The Contractor and subcontractors are responsible for ensuring that building occupants and those in adjacent areas are not exposed to lead dust or debris as they enter or exit buildings. The Contractor and subcontractors shall ensure that building occupants and others in the adjacent area do not enter the lead regulated area and have a safe means of access and egress to the building.

For exterior work site preparation, one layer of six-mil poly sheeting shall be placed on the ground extending at least ten feet beyond the perimeter of surfaces included in the work. This poly sheeting must be extended a minimum of twenty feet for a multistory building. Depending on wind conditions, the poly may need to be extended further than the ten and twenty foot minimums. The poly on the ground must be adequate to catch all lead-containing debris and water. For example, if the work involves the scraping of paint, all paint chips, dust, debris and water that is released by the work must be contained on the poly.

The poly must be secured to the side of the building or structure with tape, or other anchoring system, so that there is no gap between the poly and the building or structure. The poly installed to cover ground or landscaping shall be installed in a manner to ensure that it will not blow away or billow from the wind. The use of weights such as wood is acceptable as long as the poly does not billow or blow in a manner that releases lead dust or debris off it.

The exterior of all windows located within ten feet of any disturbance of lead must be sealed by covering them with at least one layer of six-mil thick poly sheeting. All ventilation machinery within 20 feet of the disturbance should be sealed by at least one layer of six-mil thick poly sheeting. Keep all windows within 20 feet of working surfaces closed, including windows of adjacent structures.

Should the disturbance of paint involve removing paint from the exterior of a window, then the Contractor or subcontractor must seal the inside of the window with two layers of six-mil thick poly. The Project Monitor will typically waive the requirement to seal the inside of the window with two layers of poly if the disturbance of lead involves less than 5% of the painted surface area of an exterior window.

Those in adjacent areas must be kept a sufficient distance from any chance of encountering lead dust and debris. Therefore, the Contractor shall erect barrier tape at a distance sufficient from the poly barriers to ensure that those passing by the area are not directly adjacent to the poly containment barriers. In general, the barrier tape should be at least five feet from the edge of the poly placed on ground surfaces if those surfaces are accessible to unauthorized persons. The area off the poly sheeting, but inside of the barrier tape, is still part of the regulated area however and is not allowed to have any lead dust or debris present at any time.

The Contractor and/or subcontractor must post the regulated area sign as described in 8 CCR 1532.1 (m) (WARNING, LEAD WORK AREA, POISON, NO SMOKING OR EATING.) The posting may be done by wording on the barrier tape or by suspending OSHA-approved signs with the wording on the tape barriers or on readily apparent surfaces visible to persons outside the area.

All those entering the regulated area must sign in on a roster that documents their presence in the area. This roster must be provided the Owner and/or Project Monitor on a daily or weekly basis as determined by the Project Monitor.

Work disturbing lead shall not be conducted on exterior surfaces if wind speeds are greater than 15 miles per hour or, in the judgement of the Project Monitor, pose a risk of blowing lead dust or debris out of the regulated area.

In addition, for work done on ladders or man lifts, the Project Monitor is likely to require the workers to scrape loose and peeling paint directly into a container, rather than let the loose debris float down and possibly off the containment barrier. Typically, the Project Monitor/Project Supervisor will allow the workers to scrape loose and peeling paint into a cardboard box held in one hand while scraping with the other hand.

Work must stop and cleanup occur before rain begins.

The Contractor shall not leave debris or poly sheeting out overnight if work is not completed. The Contractor shall keep all debris in a secured area until final disposal.

3.6.2 Interior Site Preparation & Containment

For interior work site preparation, one layer of six-mil poly sheeting must be placed on the entire floor. However, the entire floor area need not be covered by poly for large interior areas where the disturbance of lead is limited to the perimeter of the area. If the entire floor area is not covered with poly, the poly must extend out a minimum of ten feet from those areas where lead will be disturbed. The poly sheeting must be secured to the wall using tape so there is no gap between the floor and the wall. The poly must also be secured to the floor.

If individual rooms are being worked in, seal all doorways with a primitive airlock flap to prevent contamination of other areas of the building. Post the regulated area signs, as required by 8 CCR 1532.1 (m), at the entrance to the regulated area and all other entry points to the area.

All those entering the regulated area must sign in on a roster that documents their presence in the area. This roster must be provided the Owner and/or Project Monitor on a daily or weekly basis as determined by the Project Monitor.

If feasible, turn off all HVAC systems in the regulated work area. In addition, seal all ventilation systems in the regulated work area with a minimum of one layer of six-mil poly. Any exceptions to this requirement must be approved by the Project Monitor. Typically, the Project Monitor will require all ventilation system ducts and/or registers to be sealed with poly if they are within 20 feet of the disturbance of lead even if they are turned off. Seal all furniture or other equipment that must remain in place with a layer of four or six-mil poly. A minimum of six-mil poly is required for all work disturbing ceramic tile.

Small amounts of ceramic tile, such as covering less than two square feet, may be removed using this type of interior containment if the tiles are removed using hand tools and remain substantially intact during the removal process. Additional requirements for interior site preparation are required when surfaces covered by lead-containing ceramic tile are demolished. Those requirements are discussed in Part 3.6.3.

3.6.3 Containment Requirements- Removal of Ceramic Tiles or use of Mechanical Means

This part primarily addresses work that will involve the demolition of building surfaces covered by lead-containing ceramic tile. These requirements shall also apply shall the Contractor and/or subcontractors disturb lead-containing material, in an interior space, using mechanical or blasting methods without a HEPA-filtered recovery system approved by the Project Monitor.

Altadena Library

In addition to the requirements stated in Part 3.6.2, the demolition of ceramic tile that involves the breakage or cutting of the tile must be done inside a negative air pressure containment system. The negative air pressure must be generated using an air filtration unit that has been challenge tested on site as described in Part 2.2 Challenge Testing Of HEPA Filtration Systems.

Seal all critical barriers between the work area and the adjacent areas with a minimum of six-mil thick poly. Critical barriers are any openings in the surface areas of the regulated work area through which air, dust, or water might pass. This includes, but is not necessarily limited to all windows, doors, HVAC vents and units.

All objects or equipment that cannot be removed from the area must be covered and tape sealed with a minimum of six-mil thick poly. Any exceptions to this requirement must be specifically approved by the Project Monitor.

Typical decontamination requirements for paint scraping and most manual demolition are discussed in Part 3.6.4 Decontamination Procedures. However, the decontamination procedures surrounding the demolition of ceramic tile are much more stringent and are described below.

All regulated work areas where ceramic tile will be broken, or other tasks that will, in the opinion of the Project Monitor/Project Supervisor, generate significant amounts of lead dust, must include a personal decontamination area and the supervisor must ensure that, at a minimum, the following procedures are followed.

a. Work That Disturbs Less Than 100 Square Feet Of Lead-Containing Material

Work involving the demolition of less than 100 square feet of lead-containing material, including ceramic tile, is not expected to result in airborne exposures over the PEL. Therefore, the personal decontamination system may, at a minimum, be a one stage decontamination system that separates the work area from the adjacent areas.

1. This must, at a minimum, include an airlock chamber between the work area and the adjacent areas. Each side of the air lock must be covered by poly curtains. At no time, including during the removal of waste containers, may the poly doors be open on both sides of this chamber at the same time. This chamber must be a minimum of three feet by three feet by six feet tall. There must be a clean poly drop cloth measuring at least five feet by five feet immediately outside this air lock onto which workers will step after exiting the air lock. This poly drop cloth must be kept visually clean of dust and debris at all times. This poly drop cloth shall be removed at the end of the work shift and replaced with a new clean poly drop cloth at the start of the next shift.

2. The workers must be able to remove their protective clothing and wash off their respirator before leaving the work area. The supervisor must ensure that they do not track lead containing materials out of the work area on their feet. Footwear worn out of the work area must have been covered by protective booties if worn in the work area. Following removal of the protective covering over the footwear, all footwear worn in the work are must be HEPA vacuumed before allowing it to be worn out of the regulated area. Footwear that can be washed before leaving the work area doesnot need to be covered by protective booties as long as the exterior of the footwear is thoroughly washed prior to being worn outside of the regulated area.

3. After they leave the decontamination chamber, workers must go directly to a nearby location where they must throughly wash their hands and face. Cal/OSHA specifically states that the supervisor must ensure this washing takes place.

4. Special attention must be given that workers do not track lead dust out of the work area on the soles of their feet or shoes.

5. Following the exit of workers from the work area, whether leaving for breaks or at the end of the day, the supervisor must visually inspect the area outside the decontamination system to verify that no dust or debris is being tracked out.

6. The Contractor shall not permit the storage or consumption of food and/or beverages inside the containment or within any of the decontamination chambers. Food or drink consumption within containment may result in the worker(s) dismissal from the site for the duration of the project.

7. Work will be stopped if the Project Monitor determines that the decontamination system is not kept in acceptable condition or used properly.

b. Work That Disturbs More Than 100 Square Feet Of Lead-Containing Material

For all work that disturbs more than 100 square feet of wall ceramic tile, the decontamination system must be a full, three-stage decontamination chamber with a shower as described below.

1. The three-stage decontamination unit with shower must be contiguous with the containment unless determined infeasible by the Project Monitor.

2. The worker decontamination enclosure system shall consist of at least a clean room, a shower room, and an equipment room, separated from the work area by airlock chambers. The airlock chambers shall be at least three feet square in size. All fabricated units shall have, at a minimum, two layers of six-mil poly sheeting.

3. Entry and exit from all airlock chambers and the decontamination enclosure system chambers shall be through doorways designed to restrict air movement between chambers when not in use. The dirty side shall have an extra layer of six-mil poly sheeting on the floor as a an extra drop cloth and it shall be replaced at least daily.

4. The clean room shall be sized and equipped to adequately accommodate the work crew. Lighting, heat and electricity shall be provided as necessary for comfort. This area must remain clean. If in the judgement of the Project Monitor, equipment storage or other activities taking place in this area affect the cleanliness of the area, the Contractor may be required to move that storage and those activities away from the designated clean area.

5. The shower room shall contain one or more showers as necessary to adequately accommodate workers and shall meet OSHA requirements for temporary shower facilities. The shower enclosure shall be constructed to ensure against leakage of any kind. In addition, the shower shall be a separate unit from the decontamination unit walls. The shower unit cannot be made from poly. Metal or hard plastic is acceptable. An adequate supply of soap, shampoo and towels shall be supplied by the Contractor and available at all times.

6. Shower water shall be drained, collected and filtered through a system with at least a five micrometer particle size collection capability. Filtered waste water shall be disposed of into a sanitary sewage system. Under no circumstances may it be

released where it might enter a storm drain.

7. The shower chamber shall be, at a minimum, three feet by three feet wide by a minimum of six feet in height. The shower chamber shall be constructed so that no water from the shower can spray out of the chamber, nor any water run down the sides of the poly and escape the chamber system. The Contractor must have a back-up containment system to control leaks from the shower, connections and hoses. This can be either a secondary metal pan under the shower or a series of poly barriers, separate from the construction of the chamber, that are solely for the purpose of collecting water that might leak out of the shower system.

8. Each decontamination chamber shall have, at least, a four inch lip of poly from the floor up the wall to prevent possible transfer of water and debris between chambers. Excess poly at the corners of this floor is to be fitted to the sides of the chamber by folding poly and taping, as opposed to cutting away excess poly and taping seams. For some projects, particularly those where the decontamination chambers are located on surfaces needing special protection from water, the Project Monitor may determine additional precautions are necessary such as requiring the shower chamber to have an overflow pan, in which the shower unit sits, that is capable of holding two inches of water. The filter system and any hose connections transferring contaminated water shall be located in a secondary containment, such as a metal pan. Any leakage shall be double-bagged or re-filtered. Should this requirement for an additional metal pan under the shower be required, it will be identified elsewhere in these specifications and discussed at the bid walk.

9. Unless otherwise specified in these specifications, the minimum size of the decontamination chambers shall be the following:

Clean Change Room	five feet x six feet x six feet high
Shower	three feet x three feet x six feet high
Dirty Change Room	five feet x six feet x six feet high
Air Lock Chambers	three feet x three feet x six feet high

10. The Dirty Change Room may be part of the work area as long as a separate drop cloth is placed down before the entrance to the first airlock chamber and this drop cloth dust not contain significant quantities of debris from the work area.

11. There must be a clean poly drop cloth measuring at least five feet by five feet immediately outside the clean side airlock onto which workers will step after exiting the airlock. This poly drop cloth must be kept visually clean of dust and debris at all times. This poly drop cloth shall be removed at the end of the work shift and replaced with a new clean poly drop cloth at the start of the next shift.

12. Special attention must be given that workers do not track lead dust out of the work area on the soles of their feet or shoes. Footwear worn out of the work area must have been covered by protective booties if worn in the work area. Following removal of the protective covering over the footwear, all footwear worn in the work are must be HEPA vacuumed before allowing it to be worn out of the regulated area. Footwear that can be washed before leaving the work area does not need to be covered by protective booties as long as the exterior of the footwear is thoroughly washed prior to being worn outside of the regulated area.

13. Following the exit of workers from the work area, whether leaving for breaks or at the end of the day, the supervisor must visually inspect the area outside the

decontamination system to verify that no dust or debris is being tracked out.

14. The Contractor shall not permit the storage or consumption of food and/or beverages inside the containment or within any of the decontamination chambers. Food or drink consumption within containment may result in the worker(s) dismissal from the site for the duration of the project.

15. Work will be stopped if the Project Monitor determines that the decontamination system is not kept in acceptable condition or used properly.

3.6.4 Decontamination Procedures

Decontamination procedures shall be established by the Contractor and subcontractor depending upon the airborne concentrations of lead as well as the amount of dust and debris created by the work. At a minimum, the decontamination procedures shall be in compliance with 8 CCR 1532.1 (l)(1-5). As stated in 8 1532.1 (l)(1-5), the Contractor shall assure that these decontamination facilities are used by the supervisor and workers.

For work that does not exceed the PEL, and/or does not include the disturbance of more than 100 square feet of material, the Contractor and/or subcontractor must assure that a hand-washing station is available and used by the supervisor and workers. For work that exceeds the PEL, or involves the breakage of ceramic tile in amounts over 100 square feet, the Contractor must ensure that workers shower, at a minimum at the end of the work shift as required by 8 CCR 1532.1.

3.6.5 Avoiding Contamination Of Adjacent Areas By Proper Decontamination

Should the Owner and/or Project Monitor discover that an occupant of the regulated area left the regulated area without properly decontaminating; the Contractor will be required to clean the adjacent areas that in the opinion of Project Monitor may have been exposed to lead dust or debris from this action. Failure to properly decontaminate is demonstrated by wearing protective clothing outside the regulated area that was previously worn in the area or by wearing footwear outside the regulated area that was not properly covered and/or decontaminated. The failure to adequately decontaminate will trigger the following cleaning. In all areas determined necessary by Project Monitor, the Contractor will be required to HEPA vacuum, then wet wash, then HEPA vacuum again all potentially contaminated areas and items to the satisfaction of the Project Monitor. The Project Monitor will not need to demonstrate the need for this cleaning by the presence of visible dust and will not need to collect settled dust samples in order to require the Contractor to implement the cleaning routine.

3.6.6 Approval Prior To Start Of Work

The Project Monitor shall visually inspect any regulated area for compliance with this specification before the contractor and/or subcontractor may begin work that may disturb lead. The contractor and/or subcontractors may not begin work disturbing lead without approval from the Project Monitor. The contractor and/or subcontractor must contact the Project Monitor sufficiently in advance of needing the visual inspection and coordinate with the Project Monitor in order to minimize any delays resulting from the need for this visual inspection.

Typically, once the Project Monitor has reviewed the contractor and/or subcontractors regulated work area set up, the work site supervisor will be told that they may start work at future regulated work areas without prior authorization from the Project Monitor as long as they assure the Project Monitor that the containment and work practices will be implemented as approved by the Project Monitor.

3.7 Wet Work Practices

Unless determined infeasible by the Project Monitor, all disturbance of lead-containing materials must utilize wet methods for dust suppression.

3.8 Prompt Cleanup Of Debris

Removed lead-containing material shall be kept wet and promptly placed in the type of waste containers required by this specification. The Contractor and subcontractors are encouraged to place debris in containers shortly after it has been removed. However, at a minimum, all bulk debris must be containerized before any work stoppages such as for breaks, lunch, or the end of a shift. Bulk debris must be kept adequately wet until it is containerized. The Contractor must plan only to disturb amounts of material that can be cleaned up and containerized before the next work stoppage. Delays and additional costs incurred by the Contractor for failing to adequately calculate the amount of time needed to clean up debris will be the sole responsibility of the Contractor. For example, if a crew must work overtime to containerize debris before ending the shift, those additional costs are the sole responsibility of the Contractor.

The Contractor and/or subcontractor must not allow excessive amounts of dust and debris to gather on the floor containment barriers. If in the opinion of the Project Monitor, too much debris is being allowed to gather on the floor poly, the Project Monitor will require the Contractor or subcontractor to either assign a worker to conduct continual cleanup, or the workers scraping paint or conducting other work disturbing lead will have to contain the debris before it falls to the ground. Typically this is done by scraping paint directly into a cardboard box held by the worker as he or she scrapes off the loose and peeling paint.

3.9 Final Cleanup Of The Work Area

3.9.1 Exterior Work Areas

The Contractor and/or subcontractor must HEPA vacuum up all visible dust and debris off containment barriers. Then gently roll and/or fold poly barriers in on themselves in order to avoid releasing any remaining dust to adjacent areas during this process.

The final step will be to vacuum up any visible dust or debris in the work area or regulated area that is suspected to contain lead. The area must be visually clean of all lead-related dust and debris, and all poly barriers must be removed before the workers leave the job site. The regulated area barrier tape and/or signs must be taken down. Critical barriers erected on windows and HVAC systems may be left in place if work will take place in those same areas during the next work shift. Otherwise those barriers must also be removed before the workers leave at the end of the shift.

3.9.2 Cleanup Of Interior Work Areas

All cleanup of the interior work area shall be performed using a HEPA vacuum and wet washing techniques. All surface areas in the work area that reasonably could have been exposed to airborne lead must be HEPA vacuumed and/or wet washed. This includes wall surfaces when the work included ceramic tile demolition. Ceilings must also be cleaned if the ceilings are less than five feet above the area where ceramic tiles were disturbed. For example, if the ceramic tile wainscoting extended six feet up the wall, and the ceiling is at eleven feet or lower, the ceiling will need to be vacuumed. If, however, the ceiling is above eleven feet, it will not need to be cleaned. This is based on the assumption that lead dust is unlikely to migrate up more than five feet. If in the judgement of the supervisor or Project Monitor the ceiling may be contaminated, the ceiling shall be cleaned regardless of how far it is above the disturbance of the tile.

3.10 Final Inspection Of The Work Area

The Project Monitor will inspect work areas for visual signs of dust and debris related to the disturbance of lead. The Project Monitor will not inspect or evaluate the quality of paint preparation work such as paint scraping. The contractor who will be painting the prepared surfaces is responsible for the quality and workmanship of the surface preparation. However, if the work involves the removal of loose and peeling paint

prior to the demolition of a structure, the Project Monitor will evaluate the completeness of that work.

For exterior work, the Project Monitor will visually inspect the work area to determine that there is no visible dust or debris still in the area that is reasonably expected to have been generated by the work. All poly barriers (except for on critical barriers in areas needed for the next shift) and barrier tape and signs must be removed.

Until told otherwise by the Project Monitor, the supervisor must notify the Project Monitor in advance of the end of the shift in order for the Project Monitor to visually inspect the work area prior to the workers leaving for the day. Typically this will not be required after the workers demonstrate that they consistently properly clean the work area before leaving.

For interior work, the Project Monitor will conduct a thorough visual inspection for dust and debris that may be related to the disturbance of lead. All surface areas must be clean. Residue dust will be assumed to contain lead and must be cleaned.

Until told otherwise by the Project Monitor, the supervisor shall notify the Project Monitor when the supervisor believes the work is complete and ready for a visual inspection. Prior to calling the Project Monitor for the visual inspection, the supervisor must personally inspect the area and determine that it is clean and ready for a final inspection.

The Project Monitor typically will not collect dust wipe samples to verify the cleanliness of an area unless specifically stated otherwise elsewhere in these specifications. However, dust wipes may be collected in either of the following circumstances. In both cases the supervisor will be told of the possibility of the collection of dust wipes and encouraged to conduct extra cleaning of the areas.

a. Ceramic Tile Removal Closely Adjacent To Kindergarten Classrooms, Daycare Facilities, or Food Preparation Areas Including Kitchens and Eating Areas.

   The Project Monitor is likely to conduct dust wipe sampling on the floor in the area between the decontamination unit and occupied areas of the property where children under the age of six routinely may be present. The supervisor will be told in advance that this testing will take place and is encouraged to clean the area between the decontamination area and where the sample will be collected. This sample will be collected within 20 feet of the decontamination chambers unless the Project Monitor believes that poor work practices or decontamination procedures have contaminated the area as discussed below.

b. Failure To Comply With Work Practices, Engineering Controls, Or Decontamination Procedures

   If in the judgement of the Project Monitor, the Contractor and/or subcontractor has not followed the requirements of this specification regarding work practices, engineering controls, and decontamination procedures, the Project Monitor will collect dust wipe samples in areas believed contaminated by the Contractor or subcontractors' actions. The supervisor of the project will be told in advance if such testing will be conducted and given time to clean those areas. For example, Part 3.6.5. describes actions that will lead to additional cleaning by the

Contractor.

Should dust wipe sampling be necessary, the Project Monitor will conduct such testing with the specified intent of verifying whether the containment process and decontamination processes used by the Contractor and/or subcontractor were adequate in preventing the release of lead dust from the work area. The samples will be collected according to the procedures required in Title 17. The containment will be judged appropriate if the results of the samples do not indicate a dust lead hazard for floors as specified in Title 17.

3.11 Power Washing of Exterior Building Surfaces

For the purposes of this procedure power washing is defined as the use of a low pressure "power washer" to rinse and/or wash stable, painted or coated surfaces to remove dust, dirt, grime, and other foreign matter in preparation for re-painting. In no circumstance is this to be construed as water blasting, and is not intended nor shall be used to remove lead-containing paints or coatings from surfaces. Loose and peeling paint must be removed by the other methods described in this specification before power washing may be conducted. Should power washing begin to release paint from the substrate, the Contractor must stop the power washing process and remove the loose material following the procedures described in these specifications.

3.11.1 Waste Water Discharge Permits

Many local sanitation districts require the completion and submission of a waste discharge permit prior to allowing the use of power washers. Therefore, prior to performing power- wash operations, the Contractor must obtain a Wastewater Discharge Permit for Surface Washers, if required, from the local Sanitation District, Water Quality Division; Industrial Waste Section, and adhere to the permit requirements. It is the Contractor's responsibility to obtain and properly fill out a current copy of this permit if it is required.

3.11.2 Required Work Practices For Power Washing

Where power washing of exterior surfaces of buildings coated with lead-containing paint(s) or seal coats is specified, or in those areas where the Contractor opts to use power washing to prepare surfaces, all of the following conditions must be met prior to uncontrolled washing without waste water control/collection measures. The following test is conducted prior to allowing the beginning of full power washing in order to verify that measurable amounts of lead are not being released by the washing process. Once it is determined that the washing process does not release lead, the Contractor will be allowed to proceed with power washing with only minimal additional requirements.

a. The Contractor in coordination with the Project Monitor shall select a minimum of one test area typical of the surfaces to be power washed. This area shall be100 or more square feet in area. On some sites where the building surfaces are different, the Project Monitor may require more than one area to be tested.

b. The Contractor shall construct a floor containment for the test areas. The containment must be designed to capture and collect all wash water and any paint chips generated during the assessment. Typically the Contractor simply needs to use poly on the ground to create a basin like effect which will capture the spray water.

c. The Project Monitor will first collect a sample of source water such as from the hose tap. The Contractor will then be asked to power wash the test area in a similar manner as to how the building as a whole will be power washed. Work shall be halted if the washing process causes delamination of paint from the test area surfaces. Modifications to the methods and work practices shall be made prior to resumption of power washing and these modifications must be approved by the Project Monitor prior to their implementation.

d. The Project Monitor will collect one or more samples of the water runoff that was captured by the Contractor following power washing the test area. As long as there are no visible paint chips in the water and/or the amount of water is not excessive, the Contractor may release the captured water as long as it is absorbed by landscaping or will evaporate. No waste water resulting from power washing operations may be allowed to drain into any storm drain as required by the State of California.

e. The Project Monitor will send these samples to a laboratory for lead in water analysis. The sample results for the source water will be compared to the water runoff sample. If similar amounts of lead are present in each, the Project Monitor will reach the conclusion that the power washing process is unlikely to release lead into the water or surrounding area during the power washing process. Typically the power washing process does not release lead as long as loose and peeling paint was removed prior to the start of power washing.

f. The Owner will pay for the collection of these water samples and their laboratory analysis.

g. The Project Monitor will notify the Contractor as soon as the results of the testing process are known. Typically the Contractor will be given permission to begin power washing. The Project Monitor and the Contractor will need to discuss alternatives to power washing in the unlikely situation that the water test shows lead contamination in the runoff water.

h. The Contractor shall assume that the testing and water analysis process will take three workdays. For example, if the test is done on the morning of the first day, the water samples will arrive at the laboratory on the morning of the second day. The results of the sampling process will be available on the afternoon of the third day. Since no power washing will be allowed until this testing process shows acceptable results, the Contractor must build this testing process into the work schedule. The Contractor may choose to accelerate the testing process but this will mean that the Contractor, rather than the Owner, will pay for the transportation of the samples to the laboratory and for the rush laboratory analysis. Even under “rush” conditions, it is very unlikely that the entire process could be completed in one day. The Contractor may want to schedule the testing process prior to the completion of other paint preparation work in order to have the results by the time the paint preparation work is complete.

I. Upon receiving approval to begin power washing, the Contractor will be allowed to proceed power washing the building. The Contractor must, however, notify the Project Monitor 24 hours in advance of the beginning of power washing in order for the Project Monitor to monitor the process should he or she feel that is appropriate.

j. Employee protective measures such as disposable clothing and respirators will not be required as power washing is not likely to result in airborne exposures of lead above the Action Level.

k. Wastewater produced from power washing operations which does not contain chips of paint may be allowed to soak into the ground below the area being washed. If the area located below or around the surface to be washed does not allow for absorption into the ground, the water must be directed toward an area on the property that will allow for absorption into the ground or evaporation. The Contractor must take steps to ensure that no wastewater enters storm drains. This is State and Federal law. This runoff cannot go into a storm drain regardless of the lead content of the water.

3.12 Lead Waste Management

Proper testing and disposal of all waste material is the responsibility of the Contractor.

The Contractor must plan the work in order to minimize the generation of hazardous waste during the disturbance of lead-containing materials. The Contractor must create separate waste streams as necessary. This particularly includes the separation of any loose paint chips, flakes, or ceramic tile debris from other construction debris. All waste streams must be identified by the Contractor before the work begins and separated during the course of the project to minimize costs of disposal.

The Contractor is responsible for all costs associated with the testing, removal, packing, loading, shipping, and disposal of lead containing waste generated during this project. This does not include wastewater testing done to determine if power washing is permitted. The cost of that testing will be covered by the Owner.

The Contractor is required to comply with all regulations in Title 8 Section 1532.1 Lead in Construction and Cal/EPA Title 22 for waste classification and disposal.

3.12.1 Lead Waste Testing

The Contractor must conduct appropriate waste stream characterization testing and/or filtering prior to disposal of waste products such as water, sand, paint chips, vacuum debris, and filters generated during surface preparation activities. Once completed, the test analysis results must be submitted to the Owner and/or Project Monitor for review. The Contractor is responsible for all costs associated with waste stream testing. Contractors may choose to avoid some waste testing by presuming that the waste is a lead hazardous waste. Waste must be tested if the Contractor wishes to treat it as a non-hazardous waste.

The Contractor may not remove or dispose of the identified materials from the job site until this review has been completed and the Contractor has been informed by the Owner and/or Project Monitor of their concurrence that the materials have been properly tested and meet the requirements allowing the materials to be classified as non-hazardous.

3.12.2 Hazardous Waste Manifests

For all hazardous waste that requires an EPA manifest, the Contractor must coordinate with the Owner for signature of the manifest. In general, the Contractor must notify the Owner a minimum of 24 hours in advance of the need for a signature. Hazardous waste cannot be transported without an authorized signature so it is the responsibility of the Contractor to coordinate with the Owner the time waste transporters will need the signature. Delays resulting from the failure of the Contractor to obtain an authorized signature from the Owner will be the sole responsibility of the Contractor, unless the Owner was provided 24 hour in advance notice and the transporter arrived on time during the regular work hours of the Owner.

3.12.3 Waste Containers

All debris generated in the regulated work area shall be placed in containers approved by the Project Monitor. The containers shall be leak tight and meet the requirements as stated in these specifications. Bags and other containers shall not be overfilled.

If in the judgement of the Project Monitor, the Contractor’s method of containerizing debris is inadequate and either results in the release of dust or debris or is reasonably expected to result in such a release, the Contractor will be forbidden to continue waste containerization or load out until the containers meet the approval of the Project Monitor. This may result in the Contractor being required to change from one type of container to another. It must be understood that the Contractor is responsible for proper containerization of waste and therefore, will be required to provide for adequate and appropriate containers regardless of cost

incurred due to failure of one system of containerization being required over another.

When utilizing bags to contain lead hazardous waste, two bags at least six-mil in thickness must be used. The inner bag may be sealed with adequate amounts of tape necessary to secure the opening of the bag. Only the second or final bag must be gooseneck sealed.

Regardless of the wastes characterization or designation as construction debris or hazardous waste, all waste containers shall be stored in designated and secure areas separate from the work area prior to testing and/or disposal.

The Contractor is responsible for proper storage and labeling of all hazardous waste containers while they are being used as storage and before they leave the job site according to the requirements of DTSC and DOT.

Building components such as wood with loose and flaking paint must, at a minimum, be wrapped in one layer of six-mil poly and adequately sealed with tape to secure the containerized material.

Concentrated lead waste such as sludge from paint stripping operations, lead containing paint chips and/or dust, HEPA vacuum contents and filters must be assumed to be hazardous waste until properly tested and must, at a minimum, be placed in poly lined, DOT approved steel drums.

Hard edged materials such as floor tile, gypsum board, plaster, stucco, ceramic tile, and other materials that may tear bags must be assumed to be hazardous waste until properly tested and must, at a minimum, be placed in poly lined, ridged-walled containers such as fiber drums or cardboard boxes as the final container.

Sharp edged components with peeling, blistering or flaking paint (e.g., nails, screws, metal lath, tin sheeting, door frames, etc.) must, at a minimum, be wrapped in one layer of six-mil poly sheeting, or a single six-mil thick bag and adequately sealed with tape to secure the containerized material.

3.13 Alternative Work Plans

The Contractor and/or subcontractors may submit alternate work plans to the suggested work practices and containment strategies as stated in these specifications. These alternate work plans or containment strategies must be approved by Owner and/or Project Monitor prior to their implementation.

PART 4.0 DOCUMENTATION SUBMITTAL REQUIREMENTS

Pre-Start Submittal Form

This form must be completed, signed, and submitted with the Contractor and/or subcontractors' documents required prior to the start of work. This form and these documents must be submitted to the Owner and/or Project Monitor/Supervisor in the time specified in the project documents prior to the start of work disturbing lead.

Please attach submittals in the order listed below. Please check off each item that is submitted. Write NA in spaces for which you believe the requirement is Not Applicable.

All Contractors and subcontractors who will have employees disturb lead on this project must, at a minimum provide proof of item number 1.6.1.e.1., lead hazard communication training in compliance with 8 CCR 1532.1 (L)(A)(1). This is the only submittal that must be provided by these employers as long as they do not disturb more lead than is described in Part 1.5.1.

The following submittals must be provided by all Contractors and subcontractors who will, at a minimum, have employees who will conduct trigger tasks for more than one hour per shift, will potentially be exposed above

the Action Level, or will conduct other activities as determined by the Project Monitor that may result in significant exposure to lead.

4.1 - Pre-Construction Submittal List

a. ____ A written lead compliance plan in compliance with 8 CCR 1532.1 must be provided that includes the following:

1. ____ A description of equipment and materials, controls, crew size, job responsibilities, and operations and maintenance procedures for each activity in which lead is disturbed and potentially emitted;

2. ____ A description of specific control methods (wet methods, engineering controls, etc.) that will be used to ensure workers are not exposed above the PEL;

3. ___ Technology considered in meeting the Cal/OSHA permissible exposure level (PEL);

4. ____ Air monitoring data documenting sources of lead emissions;

5. ___ A detailed implementation schedule for the compliance plan, including the schedule for inspections by a competent person;

6. ___ A description of the lead work practice program, which will be used to control worker exposures. This includes the use of protective work clothing, equipment, hygiene facilities and practices, and housekeeping practices;

7. ____ A description of the steps the Contractor or subcontractor will take to minimize the generation of hazardous waste produced on this project. This includes, but is not necessarily limited to how the contractor will separate waste streams. For example, how will the Contractor or subcontractor will keep potentially hazardous waste such as paint chips and dust from being disposed of with other potentially non-hazardous construction materials and debris.

b. ____ Copy of the Contractor or subcontractor has written respirator program in accordance with the requirements of 8 CCR 1544.

c. ____ Proof that all employees expected to wear respirators on this project have medical approval to wear a respirator.

d. ____ Copies of respiratory fit-tests for all workers expected to wear a respirator on this project. Fit testing must be done as required by and in accordance with 8 CCR 1544.

e. Proof of training required by Part 1.5 for type of work employee will do.

1. ___ Proof of Hazard Communication Training for Lead for those exposed to lead or who will perform trigger tasks for less than one hour. *(Proof may be a certificate or written statement stating training was completed and a list of names of those individuals who were trained. Proof of this training is not needed if employee provides proof of training required by items e. 2, or e. 3.)*

2. ____ Proof of training in compliance with 8 CCR 1532.1 (l)(2) for all employees who will conduct trigger tasks as defined in 8 CCR 1532.1 (d)(2) for more than one hour or who will reasonably be expected to be exposed to lead above the Action Level. *(Proof may be a certificate or written statement stating training was completed and*

a list of names of those individuals who were trained.) Not required if providing proof of training required in item e.3 and/or item e.4.

3. ____ Proof of CDPH lead certification for those workers who will conduct trigger tasks as defined in 8 CCR 1532.1 (d)(2) or will reasonably be expected to be exposed to airborne levels of lead above the PEL. This is required for this work on all projects that will disturb more than 100 square feet of lead-containing material. *(Proof of certification will be a currently valid CDPH certification card as a worker or supervisor. Workers who can show proof of a valid course completion form and application being submitted to CDPH, will be allowed to work while awaiting full certification from CDPH.)*

4. ____ Proof of current CDPH certification as a lead supervisor for the on-site competent person for projects involving the conduction of trigger tasks or other activities reasonably expected to exceed the PEL. This is required for this work on all projects that will disturb more than 100 square feet of lead-containing material. (*Proof of valid certification will be a currently valid CDPH certification card)*

5. ____ If exception to requirement for CDPH certified supervisor listed in Part 1.5.3 is requested, then provide proof of CDPH certified supervisor who will verify containment, personal protection and work practices, and will be able to respond to the project within two hours of request by the Project Monitor. *(Only applicable for paint scraping work done prior to the demolition of buildings or structures.)*

f. _____ Copies of all current SDS for chemicals used on this project.

g. ____ Manufacturers' certifications that high efficiency particulate air (HEPA) vacuums, pressure differential units and other local exhaust ventilation equipment conform to ANSI Z9.2-79 for all HEPA-filtered equipment that will be used on this project. *(This is proof that the equipment is actually HEPA filtered. This is separate from the challenge testing requirement needed for equipment used in interior spaces.)*

h. ____ Name and contact information of independent testing company who will challenge test all vacuums and air filtration devices used on this project (in interior spaces).

I._____Statement regarding compliance with all Cal/OSHA exposure monitoring required for this project.

j. ____ Name and contact information for laboratory who will analyze air samples or waste samples and documentation of their certification to conduct such analysis.

k. ____ Name of Waste Transporter who will transport hazardous waste on this project and documentation that the Transporter is allowed to transport lead hazardous waste.

l. _____ Name of Waste Landfill to which lead hazardous waste will be sent and documentation that such landfill is allowed to accept such waste.

m. ___ Should wastewater filtration be required on this project, submit manufactures documentation pertaining to the capability of wastewater filters to filter particles of, at a minimum, five micrometers in size.

n. ____ List of all rented equipment to be used within a lead regulated area, or a statement that no rental equipment will be used on this project.

1. ____ If rental equipment is to be used, submit written statements from each rental company indicating the rental company's acknowledgment that the equipment is provided for and may be used in areas where airborne levels of asbestos and/or lead may be present.

o. ____ Submit emergency plans. At a minimum submit the following:

1. ____ Submit non-emergency telephone numbers, other then 911, for the appropriate Police, Sheriff, and Fire Departments.

2. ____ Name, pager or cell phone numbers of the on-site supervisor and his immediate company supervisor.

3. ____ Submit detailed written directions from the project site to the medical facility to be used in case of an emergency. Also, include a map, which sufficiently shows the route to be taken from the site to the designated medical facility.

4. ____ Submit written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

p. ____ Local sanitation district Wastewater Discharge Permit for Surface Washers (if required).

q.____Cal OSHA Notification. This is required for this work on all projects that will disturb more than 100 square feet of lead-containing material.

The above listed documents must be provided in the time specified in the project documents prior to the start of work that will disturb lead. Under no circumstances will workers or supervisors be allowed to work on this project prior to the receipt of this documentation by the Owner and/or Project Monitor. In addition, documentation regarding rental equipment, but must be provided before the equipment may be used in a lead regulated area. All delays resulting from the failure of the Contractor and/or subcontractors to provide this information in the required time frame is solely the responsibility of the Contractor and/or subcontractor.

Name, Signature, and Contact Information of Contractor's Personnel Completing Pre-Start Submittal Package

NAME: _____
(Print or Type)

SIGNATURE: _____

Telephone: _____

Fax: _____

Mailing Address: _____

_____

Altadena Library

4.2 Submittals Provided During The Work (Or Following Completion Of The Work If Applicable)

The following documents must be provided the Owner and/or Project Monitor following completion of the physical activities associated with the project. The following documents must be received and approved by the Owner and/or Project Monitor before the work is considered complete. (Failure to provide these documents means the work is not complete, even though the physical activities may be completed.)

a. Daily sign-in sheet for each worker entering a lead regulated area.

b. The Contractor must provide the results of exposure sampling done to comply with the requirements of 8 CCR 1532.1 (d) and the requirements of this specification.

c. The Contractor must provide blood sampling and analysis results of lead (BLL) and zinc protoporphyrin (ZPP) levels for all workers who are represented by air monitoring results that exceed the Action Level. Typically, the Project Monitor will require blood lead sampling for all workers on a work shift if one or more air sampling results for that shift is above the Action Level.

The written results of the blood sampling analysis must be provided the Owner and/or Project Monitor within 21 days of the exposure over the Action Level or within 12 days of the completion of the project, whichever comes first.

d. Copies of job progress reports and project documentation. This must include the names of all employees onsite, the hours worked and a brief description of the work completed at the site(s).

e. The Contractor must provide all waste disposal documentation.

4.3 Lead Results List

Table 3 – Positive XRF Survey Results

Sample No.	XRF Results (mg/cm^2)	Condition of Paint	Approx Qty	Building/ Floor/ Room/ Area	Location	Surface	Substrate	Color
13	16.9	Intact	250 SF	Main Floor	Women's Restroom	Wall Tile	Ceramic	White
21	16.9	Intact	250 SF	Main Floor	Men's Restroom	Wall Tile	Ceramic	White
46	16.9	Intact	240 SF	Second Floor	Women's Restroom	Wall Tile	Ceramic	White
51	16.8	Intact	240 SF	Second Floor	Men's Restroom	Wall Tile	Ceramic	White

Altadena Library

Table 3 – Positive XRF Survey Results								
Sample No.	XRF Results (mg/cm^2)	Condition of Paint	Approx Qty	Building/ Floor/ Room/ Area	Location	Surface	Substrate	Color
61	15.1	Intact	200 SF	Lower Level	Men's Restroom	Wall Tile	Ceramic	White
65	16.3	Intact	200 SF	Lower Level	Women's Restroom	Wall Tile	Ceramic	White

Table 4 - Lead-Based Paint Bulk Sample Survey Results						
Sample No.	Building/ Floor	Location	Surface	Substrate	Color	Results (ppm)
P01	Library	Roof	Slats	Metal	White	1,200*
P02	Library	Roof	Fascia	Metal	Red	1,300*

Any material not specified on the following list which the Contractor encounters at this site must be considered as "suspect" and "assumed" to contain asbestos per US EPA. The only items excluded from this statement are; bare wood, glass, and metal.

This specification was developed by:

Matt Reilly
Certified Asbestos Consultant No. 18-6208
CDPH Lead Inspector/Assessor No. 4855
Direct Line: 925-344-1872
Email: Matthew.Reilly@oneatlas.com

PART 8: PROJECT MANUAL

PROJECT MANUAL

Altadena Main Library

BID SET
August 15, 2025



Prepared For
Altadena Library District
600 E. Mariposa Street
Altadena, CA 91001
Contact: Nikki Winslow

Prepared By
Anderson Brule Architects
325 S. First Street Fl 4
San Jose, CA 95113
Contact: Mark Schoeman
mark@aba-arch.com

Project Team
Miyamoto International
VCA Engineers
DCGA Engineers
Department of Space
Waveguide

Project: 2111010

DIVISION		COVER & TABLE OF CONTENTS
Section	00 01 01	Project Title Page 1
Section	00 01 10	Table of Contents
Section	00 01 10	Table of Contents
DIVISION 01		GENERAL REQUIREMENTS
Section	01 11 00	Summary of Work
Section	01 14 00	Work Restrictions
Section	01 23 00	Alternates
Section	01 25 00	Substitution Procedures
Section	01 25 00.1	Substitution Request Form
Section	01 26 00	Contract Modification Procedures
Section	01 29 00	Payment Procedures
Section	01 31 00	Project Management and Coordination
Section	01 31 00.1	Request for Information (Rfi) Form
Section	01 32 00	Construction Progress Documentation
Section	01 33 00	Submittal Procedures
Section	01 35 35	Construction Indoor Air Quality
Section	01 35 73	Delegated Design Procedures
Section	01 40 00	Quality Requirements
Section	01 42 00	References
Section	01 50 00	Temporary Facilities and Controls
Section	01 56 39	Temporary Tree and Plant Protection
Section	01 60 00	Product Requirements
Section	01 71 23	Field Engineering
Section	01 73 00	Execution
Section	01 73 29	Cutting and Patching
Section	01 74 19	Construction Waste Management and Disposal
Section	01 77 00	Closeout Procedures
Section	01 78 23	Operation and Maintenance Data
Section	01 78 39	Project Record Documents
Section	01 79 00	Demonstration and Training
Section	01 81 13.71	Sustainable Design Requirements - CALGreen Non-Residential Mandatory
Section	01 91 13	General Commissioning Requirements
DIVISION 02		EXISTING CONDITIONS
Section	02 41 16	Demolition
DIVISION 03		CONCRETE
Section	03 11 00	Concrete Forming
Section	03 20 00	Concrete Reinforcement
Section	03 30 00	Cast-In-Place Concrete
Section	03 31 13	Sealed Concrete
Section	03 35 20	Special Finishing
Section	03 35 46	Vapor Emission Control
Section	03 37 13	Shotcrete
Section	03 48 19	Precast Concrete Stair Treads

DIVISION 04 MASONRY

Section 04 01 20 Masonry Restoration and Cleaning
Section 04 22 00 Concrete Unit Masonry

DIVISION 05 METALS

Section 05 12 00 Structural Steel
Section 05 30 00 Metal Decking
Section 05 40 00 Cold Formed Metal Framing
Section 05 50 00 Metal Fabrications
Section 05 51 00 Architectural Metal Stairs
Section 05 52 00 Metal Guards and Railings

DIVISION 06 WOOD, PLASTICS, AND COMPOSITES

Section 06 10 00 Rough Carpentry
Section 06 16 00 Sheathing
Section 06 16 43 Gypsum and Cementitious Sheathing
Section 06 20 00 Finish Carpentry
Section 06 40 00 Architectural Woodwork

DIVISION 07 THERMAL AND MOISTURE PROTECTION

Section 07 01 50.19 Preparation for Reroofing
Section 07 11 15 Bituminous Dampproofing
Section 07 13 26 Adhesive Sheet Waterproofing
Section 07 19 00 Water Repellents
Section 07 21 00 Thermal Insulation
Section 07 24 23 Exterior Plaster Repair
Section 07 25 13 Weather Resistive Air Barrier Assembly
Section 07 26 00 Vapor Control
Section 07 54 19 Polyvinyl Chloride (PVC) Roofing
Section 07 62 00 Flashing and Sheet Metal Work
Section 07 81 00 Applied Fireproofing
Section 07 81 22 Thin-Film Intumescent Fireproofing
Section 07 84 00 Firestopping
Section 07 92 00 Joint Sealants

DIVISION 08 OPENINGS

Section 08 11 00 Metal Doors and Frames
Section 08 14 00 Wood Doors
Section 08 31 00 Access Doors
Section 08 32 13 Glazed Sliding Stacking Doors (Metal)
Section 08 34 00 Special Function Doors
Section 08 41 00 Aluminum Entrances and Storefront
Section 08 42 29 Automatic Sliding Entrances
Section 08 63 00 Metal Framed Skylights
Section 08 71 00 Door Hardware
Section 08 81 00 Glass and Glazing

DIVISION 09 FINISHES

Section	09 05 00	Moisture Control System
Section	09 21 00	Gypsum Board
Section	09 21 16	Shaft Wall Assemblies
Section	09 22 00	Acoustical Plaster
Section	09 22 16	Nonstructural Metal Framing
Section	09 24 00	Portland Cement Plaster
Section	09 30 00	Tiling
Section	09 51 00	Acoustical Ceilings
Section	09 54 34	Wood Alternative Ceiling
Section	09 65 00	Resilient Flooring
Section	09 68 13	Modular Carpeting
Section	09 81 00	Acoustic Insulation
Section	09 83 13	Acoustical Wall Treatment
Section	09 91 13	Exterior Painting
Section	09 91 23	Interior Painting
Section	09 96 00	High-Performance Coatings

DIVISION 10 SPECIALTIES

Section	10 11 00	Markerboards
Section	10 14 00	Interior Signage
Section	10 14 19	Dimensional Letter Signage
Section	10 23 10	Glazed Interior Wall Systems
Section	10 26 00	Wall and Corner Guards
Section	10 28 13	Toilet Accessories
Section	10 41 16	Emergency Key Cabinets
Section	10 44 00	Fire Extinguishers and Cabinets

DIVISION 11 EQUIPMENT

Section	11 31 00	Residential Appliances
Section	11 51 00	Library Equipment
Section	11 52 13	Projection Screens

DIVISION 12 FURNISHINGS

Section	12 24 13	Rolled Cloth Window Shades
Section	12 48 16	Entrance Floor Grilles
Section	12 52 19	Custom Upholstered Seating
Section	12 93 00	Site Furnishings

DIVISION 14 CONVEYING EQUIPMENT

Section	14 21 00	Gearless Traction Elevator

DIVISION 21 FIRE SUPPRESSION

Section	21 13 13	Wet-Pipe Sprinkler Systems

DIVISION 22 PLUMBING

Section	22 05 00	Common Work Results for Plumbing
Section	22 05 23	General-Duty Valves for Plumbing Piping

Section	22 05 29	Hangers and Supports for Plumbing Piping and Equipment
Section	22 05 48	Vibration and Seismic Controls for Plumbing Piping and Equipment
Section	22 05 53	Identification for Plumbing Piping and Equipment
Section	22 07 00	Plumbing Insulation
Section	22 11 16	Domestic Water Piping
Section	22 11 19	Domestic Water Piping Specialties
Section	22 11 23	Facility Natural-Gas Piping
Section	22 13 16	Sanitary Waste and Vent Piping
Section	22 13 19	Sanitary Waste Piping Specialties
Section	22 33 00	Electric, Domestic-Water Heaters
Section	22 34 00	Fuel-Fired Water Heaters
Section	22 40 00	Plumbing Insulation
Section	22 47 00	Drinking Fountains and Water Coolers

DIVISION 23 HEATING VENTILATING AND AIR CONDITIONING

Section	23 05 00	Common Work Results for HVAC
Section	23 05 13	Common Motor Requirements for HVAC Equipment
Section	23 05 29	Hangers and Supports for HVAC Piping and Equipment
Section	23 05 48	Vibration and Seismic Controls for HVAC
Section	23 05 53	Identification for HVAC Piping and Equipment
Section	23 05 93	Testing, Adjusting, and Balancing for HVAC
Section	23 07 00	HVAC Insulation
Section	23 23 00	Refrigerant Piping
Section	23 31 13	Metal Ducts
Section	23 33 00	Air Duct Accessories
Section	23 34 23	HVAC Power Ventilators
Section	23 37 13	Diffusers, Registers, and Grilles
Section	23 41 00	Particulate Air Filtration
Section	23 81 27	Variable Flow Split-System Heat Pump, Branch Controller and Fan Coil Units

DIVISION 26 ELECTRICAL

Section	26 01 00	Basic Electrical Requirements
Section	26 05 00	Common Work Results for Electrical
Section	26 05 19	Low-Voltage Electrical Power Conductors and Cables
Section	26 05 26	Grounding and Bonding for Electrical Systems
Section	26 05 29	Hangers and Supports for Electrical Systems
Section	26 05 33	Raceway and Boxes for Electrical Systems
Section	26 05 48	Vibration and Seismic Controls for Electrical Systems
Section	26 05 53	Identification for Electrical Systems
Section	26 05 72	Acceptance Testing
Section	26 27 26	Wiring Devices
Section	26 51 19	LED Interior Lighting
Section	26 56 19	LED Exterior Lighting

DIVISION 27 COMMUNICATIONS

Section	27 00 00	General Communications Requirements
Section	27 05 26	Grounding and Bonding for Communications Systems
Section	27 05 28	Pathways for Communications Systems
Section	27 08 00	Commissioning of Communications Systems

Section	27 11 00	Communications Equipment Room Fittings
Section	27 13 00	Communications Backbone Cabling
Section	27 15 00	Communications Horizontal Cabling
Section	27 51 26	Assistive Listening Systems

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

Section	28 16 00	Intrusion Alarm System
Section	28 31 11	Digital, Addressable Fire-Alarm System

DIVISION 31 EARTHWORK

Section	31 10 00	Site Clearing
Section	31 22 00	Grading
Section	31 23 13	Excavation Fill
Section	31 23 16	Excavation and Fill for Paving
Section	31 23 23	Excavation and Fill for Utilties
Section	31 23 26	Base Course

DIVISION 32 EXTERIOR IMPROVEMENTS

Section	32 12 16	Asphalt Paving
Section	32 12 36	Seal Bituminous Surfacing
Section	32 13 13	Site Concrete Work
Section	32 14 13	Precast Concrete Unit Paving
Section	32 84 00	Planting Irrigation
Section	32 90 00	Planting

DIVISION 33 UTILITIES

Section	33 11 00	Site Water Distribution Utilities
Section	33 40 00	Storm Drainage Utilities

END TABLE OF CONTENTS

SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Anderson Brule Architects, Inc. has prepared Contract Documents titled Altadena Main Library, Bid Set dated August 15, 2025. Work of the Contract can be summarized by reference to the Contract Documents which include the Agreement, Contract Conditions, Project Manual (General Requirements and Specifications), Drawings, documents referenced by any of these, and addenda and modifications issued prior to the signing of the Agreement.

B. Work of the Project includes all labor, materials and equipment necessary for the Contractor to fulfill all its obligations pursuant to the Contract Documents, including but not limited to the following:
   1. Project administration including preparation, research and distribution of project correspondence and submittals.
   2. Schedule preparation and maintenance.
   3. Guarantees and warranties.
   4. Temporary protection.
   5. Temporary utilities and facilities, including mobilization and demobilization,
   6. Material handling and storage.
   7. Safety Equipment.

C. Work includes providing systems to control temperature and humidity in the existing library building and the new addition. For the Project to fulfill design criteria and function as intended migration of moisture through building elements must be controlled and eliminated to the fullest extent possible. To ensure the completed Project functions as intended, exercise special care in the installation of the Work including but not limited to the following components
   1. Vapor Barriers: Continues barrier to the transmission of vapor through the assembly in which they occur. Seal all penetrations and terminations.
   2. Prevent infiltration, migration of water vapor and condensation. Seal frames of doors, and windows, penetrations for mechanical, plumbing and electrical systems and penetrations through exterior walls. Insulate exterior work.

D. Time to Complete the Work: Contractor shall achieve Substantial Completion as certified by the Architect within the time stipulated in the Supplementary General Conditions.

1.2 PROJECT INFORMATION

A. Project Identification: Altadena Main Library Renovations, ABA Project 21-1101-0.
   1. Project Location: 600 E. Mariposa Street, Altadena, CA 91001.

B. Owner: Altadena Library District, 600 E. Mariposa St. Altadena, CA 91001.
   1. Owner's Representative: Nikki Winslow, Library Director.

C. Architect: Anderson Brule Architects, 325 S. First Street, San Jose, CA 95113.
   1. Architect's Representative: Mark Schoeman, Principal.

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:
   1. Structural Engineer: Miyamoto International, 1450 Halyard Drive, W. Sacarmento, CA 95691.
      a. Contact: Traci Wong.
   2. Civil Engineer: DCGA Engineers, 4750 E. Ontario Mills Parkway, Ontario, CA 91764.
      a. Contact: Jessie Peng.
   3. MEP/Fire Supression: VCA Engineers, 1041 S. Garfield Ave, Alhambra, CA 91801.
      a. Contact: Tony Ramirez.
   4. Landscape Architect: Department of Space, 480 N. Indian Hill Blvd, Claremont CA 91711.
      a. Contact: Ben McCoy.
   5. Acoustical Engineer: Waveguide, LLC, 6060 Center Drive, Los Angeles, CA 90045.
      a. Contact: Brandon Mosst.

E. Construction Manager:
   a. Construction Manager Representative:

1.3 PROJECT CONDITIONS

A. Contractor Use of Premises: During the entire construction period the Contractor shall have the use of the premises for construction operations.

B. Project Site: Premises available to the Contractor for performance of the Work are restricted to area bounded by the Work Limit Line indicated During the entire construction period the Contractor shall have the use of these premises for their construction operations. Do not disturb areas outside the Work Limit Line.
   1. Work areas will not be available beyond the interval stipulated for execution of the Work.

C. Owner reserves the right to place and install equipment and to occupy completed areas of the Project, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
   1. Contractor shall be responsible for the following for partial occupancy by the Owner. Provide a Certificate of Occupancy from authorities having jurisdiction. Ensure mechanical and electrical systems are fully operational and required tests and inspections have been or will be successfully completed.
   2. Where Owner has partial occupancy, they will operate and maintain mechanical and electrical systems serving those portions of the building and assume responsibility for maintenance and custodial service for those portions of building.

1.4 PROCEDURAL REQUIREMENTS

A. Administration and Conduct of the Work: Carried-out with the maximum possible consideration to conservation of energy, water and materials, and to the recovery and recycling of waste and scrap. Refer to other Sections for required disposition of salvage materials which are the Owner's property.
   1. Material and Product Requirements: In addition to specific requirements for content, origin of resources, and limitation and exclusion of certain compounds, the Contractor shall, to the maximum extent possible, provide materials, equipment and products that are resource-efficient, have recycled-content, are non-toxic, and environmentally sensitive.

2. Means and Methods of Construction: Contractor shall utilize those that will minimize the potential for damage and adverse impact to the environment regardless of whether such impact is transitory or long-term.

B. Hot Work: Procedures that may elevate the risk of fire due to heat, sparks, open flame or any other cause. Useful guidelines for how work procedures may be found in Factory Mutual's FM Global Loss Prevention Data Sheet Hot Work Management 10-3. Provide advance notification as required and perform the following as a minimum.
1. Remove combustible materials, debris and dust within 35 feet of work area and protect combustible materials that cannot be removed.
2. Enclose fire risk with non-combustible screens, blankets and other suitable protection.
3. Provide fire watch during and following performance of the work at the work site and all adjacent floors or locations as appropriate to the hazard.
4. Supplement normal fire extinguishing equipment during the fire watch period.

C. Work Under Separate Contracts: Owner reserves the right to issue other contracts for work on the site which may be constructed concurrently with these Contracts.
1. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts.
2. Coordinate the Work of this Contract with work performed under separate contracts.

1.5 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Contractor shall provide all work necessary for systems necessary to support and serve Owner furnished equipment including but not limited supplemental structure and connections to building mechanical, plumbing, electrical, communications and controls systems.
1. Owner responsibilities will be to arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule. Provide necessary submittals such as Shop Drawings, Product Data, and Samples for the Contractor's information and coordination of the Work. Replacement of items damaged, defective or missing at the time of inspection during delivery and receipt at the Project.
2. Contractor responsibilities shall be to designate delivery dates for Owner-furnished items in Contractor's Construction Schedule (subject to Owner's agreement). Review submittals and return them to the Architect noting discrepancies, anticipated problems in use of product, and coordination with the Work. Receive, unload, handle, protect and store Owner-furnished items at the Project site. Contractor shall replace Owner-furnished items damaged following receipt at the Project and damage resulting from Contractor's operations. Coordination of the Work with Owner-furnished items and incorporate these items into the Work. Instruction of Owner staff, Warranty and maintenance required after installation.
3. Owner and Contractor will be mutually responsible to inspect delivered items at the Project for damage, defects, and missing items, items will be inspected on the day they arrive at the Project. Arrange for manufacturer's field services during and subsequent to installation and for ensuring the Work qualifies for any special warranty required.

1.6 MISCELLANEOUS PROVISIONS

A. Plumbing, Mechanical Electrical and Communications Work of Sections in Division 2 through 14: Comply with applicable requirements of Sections in Division 22, Division 23, Division 26 and Division 27 and other requirements of the Contract.

1. Service Connections: Provided as necessary for normal function of each unit of general work.
2. General Work: Coordinate for proper connection and utilization of available services, as necessary and required.

B. Supervision and Administration of the Work: Carried-out with the maximum possible consideration to conservation of energy, water and materials, and to the recovery and recycling of surplus material not to be delivered to the Owner and waste generated by the Work.

1.7 WORK RESTRICTIONS - REFERENCE SECTION 01 14 00.

PART 2 - PRODUCTS -- Not Used

2.1 PRE-ORDERED PRODUCTS

PART 3 - EXECUTION -- Not Used

3.1 SCHEDULE OF PRE-ORDERED PRODUCTS

END OF SECTION

SECTION 01 14 00 – WORK RESTRICTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes restriction on Contractor access and use of the premises for Work of the Contract. These requirements are in addition to requirements for Owner occupancy in Section 01 11 00 and requirements contained in technical Sections of the Project Manual.
   1. Do not disturb portions of the premises outside the Work limit line.
   2. Do not encumber the site with materials or equipment. Stockpiling and storage of materials, recycling and debris shall be contained within the area designated by the Work limit line.
   3. Contractor shall carry out the work so that the City’s emergency operations including Public Safety and 911 are not disrupted at any time.

1.2 CONTRACTOR USE OF PREMISES

A. The Contract Sum shall include all expenses, fees and costs directly and indirectly associated with limitations on access and traffic routes, delivery, storage and loading areas, traffic planning and control, after-hours and premium time and off-site storage resulting from Contract requirements and restrictions.
   1. Where Owner's facilities and services made available for the Contractor's use are not adequate to fulfill Contract requirements and facilitate efficient and timely execution of the Work the Contractor shall provide supplemental facilities and services as necessary to ensure efficient and timely execution of the Work at no change in Contract amount.

B. Throughout the Contract time use and maintain the existing facilities in a safe condition, secured against damage due to weather exposure and other potential sources of loss. Damage or loss occurring during construction operations shall be remediated at no additional cost to the Owner.
   1. Keep traffic areas such as hallways, stairs, walks, sidewalks and roadways free of encumbrance due to the Work.
   2. The Work area shall be designated Smoke Free, use of tobacco products shall not be permitted, neither shall open fires be permitted.
   3. Use of existing toilet by contractor personnel is not permitted. Provide temporary facilities per Section 01 50 00 requirements.
   4. Perform the Work without disruption to required building exits and exit routes and established traffic ways, both pedestrian and vehicular. Exit discharge shall provide a barrier free route of travel to an area of refuge acceptable to fire authorities and sufficiently sized to provide safe refuge to double the number of people for which the exit is sized.

C. Work requiring access to areas outside of the Contract area and work causing noise and vibration that may interfere with the Owner's occupancy must be scheduled at the Owner's convenience and performed outside the Owner's normal operating hours of 7 AM through 5 PM weekdays or as otherwise approved in advance by the Owner.

1.3 TRAFFIC, ACCESS AND PARKING

A. Contractor's Access to Project: Limited to designated approaches and shall not interfere with the Owner's occupancy.
   1. Keep existing driveways, parking areas, public transportation stops, walkways and entrances clear and available to the Owner and the public at all times; do not use for parking or storage of materials.
   2. Conduct the Work to allow uninterrupted access for emergency vehicles and services to the Project, and all adjacent areas.
   3. Promptly clean up debris and construction material dropped on traffic and loading areas maintain service access ways and streets to the satisfaction of the Owner's Representative.

B. When alternative routing and scheduling to avoid interference with routine street and sidewalk traffic would prevent proper performance of the Work, provide a satisfactory detour affording safe passage of traffic around or over the interference. Temporary construction support facilities shall comply with Section 01 50 00 requirements.
   1. Provide advance notice to the Owner where traffic interference and detours may impact Owner occupancy and/or emergency vehicle access.

C. Protect finished surfaces and assemblies and facilities on permanent access routes from damage due to Contractor activities.

D. Construction staging and limited parking will be available on the Owner's adjacent lot for the duration of the project. The Owner assumes no liability for vehicles, equipment or materials staged or stored on said site. Changes in parking provided by the Owner shall not be a basis for claims against the Owner.

E. Do not park trucks, store materials or cross over landscaped areas. Any plant materials damaged as a result of the performance of this work will either be replaced with new plant materials equal in size to those damaged or by payment of an amount representing the value of the damaged material as determined by the Owner.

F. Permission for access to the site may be revoked for any and all persons who violate the Owner's traffic regulations, including speed limits, parking restrictions and permit requirements.
   1. Compliance with Owner Vehicular Access Requirements: The Contractor's responsibility for Contractor personnel, operating forces and deliveries.
   2. Lock automotive type vehicles such as passenger cars and trucks and other mechanized and motorized construction equipment, when parked and unattended, prevent unauthorized use. Do not leave vehicles or equipment unattended with the motor running or the ignition key in place.

1.4 ADVANCE NOTICE REQUIREMENTS

A. Provide minimum 7 days advance notice to the Owner for activities that could affect the Owner's normal occupancy; scheduling of such activities is subject to Owner approval. The Owner shall have the right to require alternative scheduling or sequencing of Work with neither penalty nor modification to Contract Time and Sum when necessary to prevent disruption of Owner's occupancy. All costs and damages incurred by the Owner due to Contractor's failure to comply with advance notice and scheduling requirements shall be the responsibility of the Contractor.

1. Access and Contractor operations outside of conventional business hours require advance approval by Owner and coordination with Owner's security program.
2. Access to areas outside of the Work Limit Line, and work causing noise or vibration that may interfere with the Owner's occupancy: Coordinate with and approved by the Owner in advance of execution.
3. Should the Contractor, in the performance of the work, disturb, disconnect or damage any existing utilities required to remain in service, all expense arising from such disturbance, replacing or repair thereof shall be borne by the Contractor.

B. Interruption of Utilities Serving Owner Occupied Areas: Minimum 7 days advance notice and Owner approval is required regardless of magnitude or duration. Schedule utility interruption for times that will minimize disruption to Owner occupancy. Submit completed SHUTDOWN REQUEST at least fourteen days prior to requested shutdown date.
1. Identify existing utilities whether indicated or not and protect from damage.

C. Hot Work Permit: 7 days advance notice is required for activities that may elevate fire hazard or otherwise produce gases or particulates capable of activating ionization or smoke/heat detectors. Such work may include but is not limited to concrete cutting, brazing, grinding, welding and soldering. Notice requirements include submittal of a completed HOT WORK PERMIT, a sample of which is attached at the end of this Section. Alarm events resulting from Contractor's failure to comply with advance notice and permit requirements shall be the Contractor's responsibility without modification to Contract Amount nor Time.

D. Traffic Interruption: Provide 7 days advance notice and obtain written authorization Comply with Utility Shutdown requirements for elevator service interruption as necessary to provide required accessibility upgrades.

1.5 DAMAGE AND RESTORATION

A. Restore or replace as directed by the Owner's Representative damage to existing and new Work including but not limited to landscaping, paving, roads and sidewalks damaged as a result of the performance of this work at no change in Contract amount.

B. Restoration: Equal to the physical and aesthetic characteristics of the original work. Finishes shall match the appearance of similar existing adjacent work. Comply with repair requirements for cutting and patching work.

C. Remove and replace unacceptable restoration work; where work can not be acceptably restored as determined by the Owner's Representative provide new work as directed.

1.6 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work to normal business hours, Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
1. Weekend Hours: Coordinate restrictions with Owner.
2. Early Morning Hours: Coordinate restrictions with Owner where permitted by local AHJ and Zoning regulations and restrictions on noisy work.

3. Hours for Utility Shutdowns: Utility service including, but not limited to electrical power, light, heat, water, gas, steam, compressed air, oxygen, suction, telephone, must be maintained. Arrangements shutdowns with the Owner.
4. Hours for [Core Drilling] <Insert noisy activity>: [Coordinate restrictions with Owner]<Insert Owner's restrictions>.

C. On-Site Workday Restrictions: Do not perform work resulting in utility shutdowns or resulting in noisy activity on-site during work black-out days indicated in Owner's schedule.
1. Notify [Architect] [Construction Manager] [Owner] not less than [two] <Insert number> days in advance of proposed utility interruptions.
2. Obtain [Architect's] [Construction Manager's] [Owner's] written permission before proceeding with utility interruptions.

D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
1. Notify [Architect] [Construction Manager] [Owner] not less than [two] <Insert number> days in advance of proposed disruptive operations.
2. Obtain [Architect's] [Construction Manager's] [Owner's] written permission before proceeding with disruptive operations.

E. Smoking and Controlled Substance Restrictions: Use of tobacco products, vaping products, alcoholic beverages, and other controlled substances on the Project site or on any Owner's property is not permitted.

F. Pet Restrictions: Pets are not permitted on the Project site or any Owner's property, unless the pet is a service animal. Service animals must be properly restrained at all times.

G. Employee Identification: [Provide] [Owner will provide] identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

H. Employee Screening: Comply with Owner's requirements for [drug] [and] [background] screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with Owner's representative.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 01 23 00 – ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes administrative and procedural requirements for Alternates.

B. Related Sections: Sections referenced in Schedule of Alternates contain requirements necessary to achieve the Work described under each Alternate.

C. Alternate: An amount proposed by Proposer and stated in required Proposal submittals, to be added to or deducted from the stipulated sum for the Work amount when the Owner elects to implement the Scope of Work represented by the corresponding alternate as defined by the Contract Documents and including miscellaneous devices, appurtenances and accessories necessary and required for a complete installation regardless of whether specifically mentioned as part of the alternate.
   1. Alternate Amounts: Valid for 90 days from the submittal due date, and the Owner shall have the right to modify the Contract in accordance with the requirements for each and any Alternate at the amount quoted during that period.
   2. No adjustment to Contract Time will be made on the basis of acceptance or rejection of any Alternate(s).

D. Submittals: Notification of status of Alternates, accepted, rejected and deferred for later consideration; include description of accepted alternates effect on related and adjacent Work, and negotiated modifications to Alternates.

E. Sequencing and Scheduling: Modify and adjust adjacent work as required to ensure that work effected by each accepted Alternate is complete and fully integrated into the project.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Provide the work of each Alternate as identified herein and as required by the Contract documents. There shall be no change in the Contract Time nor required completion date for incorporation of any Alternate. Adjustments shall be limited to the sum indicated.
   1. Alternate 1, AD1: Provide all new work for Mariposa North Patio and Sliding Doors.
   2. Alternate 2, AD2: Provide all new work for Meeting Room Addition. See Sheet AD7.
   3. Alternate 3, AD3: Provide Children’s Area Ceiling.

END OF SECTION

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
   1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
   2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitutions shall be accompanied by a completed Substitution Request Form.
   2. Sequentially number substitution Requests.
   3. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product, fabrication, or installation method cannot be provided, if applicable.
      b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Certificates and qualification data, where applicable or requested.
      g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
      h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
      i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change in cost, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

4. Electronic Submission: Submit Substitution requests electronically in accordance with following requirements:
   a. Assemble complete substitution request package for each specification section into a single indexed file incorporating required information for the substitution request as specified in this Section with completed Substitution Request form and including links enabling navigation to each item.
      1) Substitution requests not including the Substitution Request form will be returned as "Not Reviewed."
5. Name file with a sequentially numbered submittal number or other unique identifier, including revision identifier.
6. Metadata: Include the following information as keywords in the electronic submittal file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.
   e. Keynote or finish code.
7. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractorof acceptance or rejection of proposed substitution within 15 business days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
   a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
   b. If Architect does not issue a decision on use of a proposed substitution within time allocated above, originally specified product is to be used.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. When compatibility is not readily apparent and can only be verified by a testing procedure or if specifically requested by Architect or Owner, engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. The Contract Documents are intended to produce a building of consistent character and quality of design for components of the building. The Architect will judge the design and appearance of proposed substitutions on the basis of their suitability in relation to the overall design of the Project.
   1. In order to permit coordinated design of color and finishes furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the Owner.
   2. Additional cost, or loss or damage arising from the substitution of materials or methods for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner or the Architect, unless such substitution was made at the written request or direction of the Owner or the Architect.

B. Substitutions that materially affect the work, regardless of effect on Contract Price or Contract Time, shall require AHJ approval. Such substitutions will be processed in compliance with Section 01 26 00 "Contract Modification Procedures."

C. Substitutions during Bidding: No substitutions will be allowed during bidding. Bidders to provide base bid per contract documents and basis of design products.
   1. If Bidder can add value by providing substitution, Bidder to submit voluntary alternate identifying cost reduction and/or value added along with substitution documentation required by this Section.

D. Substitutions after Award of Contract:
   1. Substitution for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 working days prior to time required for preparation and review of related submittals.
      a. Conditions: Architect, in consultation with Owner, will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
         1) Requested substitution is consistent with the Contract Documents and will produce indicated results.
         2) Substitution request is fully documented and properly submitted.
         3) Requested substitution will not adversely affect Contractor's construction schedule.
         4) Requested substitution has received necessary approvals of authorities having jurisdiction.
         5) Requested substitution is compatible with other portions of the Work.
         6) Requested substitution has been coordinated with other portions of the Work.
         7) Requested substitution provides specified warranty.
         8) If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
   2. Substitutions for Convenience: Architect will consider requests for substitution if received within 35 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
      a. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not

satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1) Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2) Requested substitution does not require extensive revisions to the Contract Documents.
3) Requested substitution is consistent with the Contract Documents and will produce indicated results.
4) Substitution request is fully documented and properly submitted.
5) Requested substitution will not adversely affect Contractor's construction schedule.
6) Requested substitution has received necessary approvals of authorities having jurisdiction.
7) Requested substitution is compatible with other portions of the Work.
8) Requested substitution has been coordinated with other portions of the Work.
9) Requested substitution provides specified warranty.
10) If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐New Product ☐1-4 years old ☐5-10 years old ☐More than 10 years old

Differences between proposed substitution and specified product: _____

☐Point-by-point comparative data attached – **REQUIRED FOR SUBSTITUTION TO BE CONSIDERED BY A/E**

Reason for NOT providing specified item: _____

Proposed substitution affects other parts of work: ☐No ☐Yes; explain: _____

Proposed substitution changes Contract Time: ☐No ☐ Yes [Add/Deduct] days.

Savings to Owner for Accepting Substitution: ($)

The Undersigned General Contractor/Construction Manager Certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified products.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- The following supporting data is attached to this request and verifies the above statements:

  ☐ Drawings
  ☐ Product Data
  ☐ Samples
  ☐ Tests
  ☐ Reports
  ☐ Other (explain) _____

Submitted by: _____

Signed by: _____

Contractor: _____

Address: _____

_____

Phone: _____ Email: _____

Review and Action:

☐ Substitution approved – Make submittals in accordance with the Specifications.
☐ Substitution approved as noted – Make submittals in accordance with the Specifications.
☐ Substitution rejected – Use specified materials.

Comments: _____

_____

_____

_____

Signed by: _____ Date: _____

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:
   1. Section 0` 15 00 Substitution Procedures for administrative procedures for handling requests for substitutions made after the Contract award.

1.2 DEFINITIONS

A. Changes in the Work: After the execution of the Contract, and without invalidating the Contract by the following methods Change Order, Construction Change Directive, or Supplemental Instruction, subject to the limitations established in the Contract and in this section.

B. Reason Codes: All change documents prepared by the Architect will be issued to with a defined reason code identifying they reason for the change to the documents.

   1. Reason Codes:

      a. Scope Revision.
      b. Unforeseeable Condition.
      c. Fast-Track Driven.
      d. Jurisdictional Agency.
      e. Builder (GC, CM, DB).
      f. Design Errors.
      g. Design Omissions.

1.3 ARCHITECT INITIATED CONTRACT MODIFICATIONS

A. Supplemental Instructions (SI): Architect will issue Supplemental Instructions (SI) authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

   1. Proceeding with the SI confirms agreement with the Architect's determination that the proposed changes do not involve adjustment to the Contract Sum or the Contract Time.
   2. If the Contractor believes the information provided in the SI involves an adjustment to the Contract Sum or the Contract Time, notify the Architect within three days of receipt and proceed with submitting a Change Order Proposal.

B. Proposal Request (PR): Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

   1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.

2. Upon receipt of Proposal Request, review the proposal scope impact on current construction schedule and critical path.
   a. Notify the Owner and Architect within three days if maintaining the construction critical path schedule requires the Proposal Request to be converted to a Construction Change Directive.
   b. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation esxtimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

C. Construction Change Directive (CCD): Architect may issue a Construction Change Directive instructing the Contractor to proceed without delay with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of the change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
2. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment will be based on one of the following methods:

   a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
   b. Unit prices stated in the Contract Documents or subsequently agreed upon.
   c. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee.

3. By signing and returning a Construction Change Directive, the Contractor agrees to the terms set forth including the change in the Work, Cost, and Time.

   a. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.
   b. Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment.
   c. Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified.
   d. Architect's interim determination of cost will adjust the Contract Sum on the same basis as a Change Order.

4. Documentation:

   a. Time and Material Basis Work: Maintain detailed records required by the Construction Change Directive.
   b. After completion of work for the Construction Change Directive, submit a Change Order with required documentation per the requirements and in the same form as required for a Change Order Proposal.

1.4 CONTRACTOR INITIATED CONTRACT MODIFICATIONS

A. Change Order Proposal (COP): Submit a Change Order Proposal to the Architect for the following conditions:

1. Contractor Initiated Proposals.
2. Proposal Request Response.
3. Administrative Change Orders.

B. Change Order Proposal Forms: Use form attached to this Section.

1. Change Order Proposals not including this form will be returned not reviewed.
2. Summary Form: Summary Form shall include total cost of change order proposal.
   a. Contractor Contingencies: Identify where costs allocated to Contractor and indicate reserved contingency after Change Order Proposal.
   b. Owner Contingencies: Identify where costs allocated to Owner Contingency and indicate reserved contingency after Change Order Proposal.
   c. Value-Added /Non-Value-Added Costs Breakdown:
      1) COP Summary: List Value-Added Costs and Non-Value-Added Costs.
      2) Value-Added Costs: Costs that would have incurred should the work have been included in the original contract documents.
      3) Non-Value-Added Costs: Costs that are included in the Change Order proposal for doing or bidding the work at the time the change is identified.
      4) Example: The omission of a door and frame.
         a) Value Added Costs: The cost to provide the door if it was in the original contract. Including the cost of the door, frame and hardware, wiring of the door hardware, and labor to install.
         b) Non-Value-Added Costs: Demolition work associated with providing the door and frame, reframing the wall to install the door and frame, additional shipping costs if discovered after door shipment, mark-up associated with Change Proposal if not Cost+ Contract.
3. Submit original Subcontractor Back-Up Information:
   a. Material take-offs on contract drawings and/or Proposal Request documents:
      1) Itemized analysis of quantity of material additions.
      2) Itemized analysis of quantity of material reductions.
   b. Material quotes and invoices:
      1) Itemized analysis of material costs.
      2) Itemized analysis of material credits.
   c. Equipment quotes and invoices:
      1) Itemized analysis of analysis of Equipment costs.
      2) Itemized analysis of analysis of Equipment credits.
   d. Labor Costs:
      1) Itemized analysis of analysis of Labor costs.
      2) Itemized analysis of analysis of Labor credits.
         a) Additional charges for Supervision will not be allowed unless Construction Schedule is modified, or overtime is required as part of Change Order Proposal.

e. Indicate applicable taxes, delivery charges, and amounts of trade discounts.

4. Updated Construction Schedule: Indicate the effect of the change, including, but not limited to:

a. Changes in activity duration.
b. Changes to start and finish times, and activity relationships.
c. Provide an analysis of using available float versus an extension of Contract Time.

5. Incomplete Change Order Proposals will be returned without review for revision to conform to the requirements.

a. Failure to conform to the requirements creating a delay in review shall not be the basis for additional Contract Sum or additional Contract Time.

C. Contractor Initiated Proposals:

1. RFI Response: After notification to the Architect, submit a Change Order Proposal within fifteen days.
2. Supplemental Instructions: After notification to the Architect, submit a Change Order Proposal within fifteen days.
3. Latent or Changed Conditions: Notify the Architect immediately when conditions are found, submit a Change Order Proposal within fifteen days.

a. In addition to requirements stipulated in the Change Order Proposal Form provide the following:

1) Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change.
2) If the proposed change requires substitution of one product or system for product or system specified comply with requirements in Section 01 25 00 "Substitution Procedures."

4. Delay Claims: Notify the Owner and Architect immediately when conditions are found, but no later than within ten days of delay event.

a. In addition to requirements stipulated in Change Order Proposal Form, provide the following:

1) Include documentation of delay origin and impact on the critical path.

b. Delay Claims based on the requirements to furnish drawings, specifications, or instructions, or to return submittals will be rejected when the Architect is in compliance with the procedures specified in Section 01 33 00 "Submittal Procedures."

D. Proposal Request Response: Submit a Change Order Proposal within fifteen days.

E. Administrative Change Orders:

1. Allowance Adjustment: Prior to substantial completion issue an administrative change order to refund allowance reserves.

a. Itemize each allowance reserve refunded.
b. Included Itemized list of Proposal Requests that charged against the allowance and amount charged by each.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Change Order Proposal, issue a Change Order for Owner's and Architect's signatures and proceed promptly with the work.

B. On Owner's approval of a Change Order Proposal, the Architect will issue a Change Order for Owner's and Contractor's signatures and proceed promptly with the work.

1. All change orders that materially affect the work, shall require AHJ approval. Architect will submit Change Order to AHJ for approval prior to Owner approval.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ATTACHMENTS

A. 01 26 00.1 Change Order Proposal (COP) Summary Forms

B. 01 26 00.2 Supplemental Instructions

C. 01 26 00.3 Proposal Request Template

D. 01 26 00.4 Construction Change Directive

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:
1. Section 01 26 00 Contract Modification Procedures for administrative procedures for handling changes to the Contract.
2. Section 01 32 00 Construction Progress Documentation for administrative requirements governing the preparation and submittal of the Contractor’s construction schedule.

1.2 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

B. Contract Sum: The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule, including the following:
   a. Application for Payment forms with Continuation Sheets.
   b. Submittals Schedule.
   c. Contractor's Construction Schedule.
2. Submit the schedule of values to Architect at earliest possible date, but no later than days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
   a. Project name and location.
   b. Owner's name.
   c. Owner's Project number.
   d. Name of Architect.
   e. Architect's Project number.
   f. Contractor's name and address.
   g. Date of submittal.
2. Arrange schedule of values consistent with format of [AIA Document G703] <Insert name and designation of standard form>.

3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
   a. Related Specification Section or division.
   b. Description of the Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
      1) Labor.
      2) Materials.
      3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of percent of the Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site.
   b. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Purchase Contracts: Provide a separate line item in the schedule of values for each Purchase contract. Show line-item value of Purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Contractor.
9. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
10. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
11. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
12. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.

B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Submit Application for Payment to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
   1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 or other forms acceptable to the Owner as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
   2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
   3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
   4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
   5. Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier unless such Work has been performed by others whom the Contractor intends to pay.

F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
   1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
   2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
   3. Provide summary documentation for stored materials indicating the following:
      a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
      b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
      c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

G. Submittal Schedules: With each Application for Payment, submit Three-Month Look Ahead Submittal Schedule as specified in Section 01 33 00 "Submittal Procedures."

H. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. Include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit conditional final or full waivers.
   3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

   1. List of subcontractors.
   2. Schedule of values.
   3. Contractor's construction schedule (preliminary if not final).
   4. Products list (preliminary if not final).
   5. Sustainable design action plans, including preliminary project materials cost data.
   6. Schedule of unit prices.
   7. Initial submittal list.
   8. Overall Submittal schedule.
   9. List of Contractor's staff assignments.
   10. List of Contractor's principal consultants.
   11. Copies of building permits.
   12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
   13. Initial progress report.
   14. Report of preconstruction conference.
   15. Certificates of insurance and insurance policies.
   16. Performance and payment bonds.
   17. Data needed to acquire Owner's insurance.

K. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
      a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 01 77 00 "Closeout Procedures."
   2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Certification of completion of final punch list items.
   3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   4. Updated final statement, accounting for final changes to the Contract Sum.

5. AIA Document G706.
6. AIA Document G706A.
7. AIA Document G707.
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Final liquidated damages settlement statement.
11. Proof that taxes, fees, and similar obligations are paid.
12. Waivers and releases.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Project meetings.

B. Related Requirements:

1. Section 01 32 00 Construction Progress Documentation for preparing and submitting Contractor's construction schedule.
2. Section 0 73 00 Execution for procedures for coordinating general installation and field engineering services, including establishment of benchmarks and control points.
3. Section 01 77 00 Closeout Procedures for coordinating closeout of the Contract.

1.2 DEFINITIONS

A. BIM: Building Information Modeling.

B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1. A document submitted by the Contractor seeking interpretation or clarification of the Contract Documents.
2. A properly prepared request for information or interpretation shall include a detailed written statement that indicates the specific Drawing(s) or Specification(s) in need of clarification and the nature of the clarification requested.
    a. Drawings shall be identified by Drawing number, Drawing Sheet and location.
    b. Specifications shall be identified by Section number, page and paragraph.
    c. Requests for information: Request made by Contractor concerning information not indicated on Drawings nor contained in Project Manual that is required to properly perform the work.
    d. Requests for Interpretation: Request made by Contractor in accordance with the Contract for construction.

C. Improper RFIs:

1. RFIs that are not properly prepared.
2. Improper RFI's will be rejected by the Architect. The Contractor will be notified by the Architect upon rejection of improper RFIs.

D. Frivolous RFIs:

1. RFIs which request information that is clearly shown on the Contract Documents as determined by Architect.
    a. Contractor is responsible to review all coordination questions and relay information within the documents to subcontractors, vendors, and/or suppliers.

2. The Contractor may be assessed $100.00 for each frivolous RFI during Project Closeout.

E. Neither improper nor frivolous RFIs will be allowed as basis for Change Orders claiming additional costs and/or time extensions.Superintendent: Represents the Contractor with any the necessary assistants who are in attendance at the Project site during the performance of the work.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities. List addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Objection to the Superintendent: Within 14 days of receipt of the information, the Owner, through the Architect will notify the Contractor, stating the reasonable objection to the proposed superintendent or if the Owner requires additional time for review.
2. Do not employ any individual to whom the Owner or Architect has made reasonable and timely objection.
3. Do not change the superintendent without the Owner's consent.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility of required maintenantce, service, and repair of all components, including mechanical and electrical.

B. Concealed or Unknown Conditions: If conditions are encountered which are subsurface or otherwise concealed or unknown physical conditions of an unusual nature are found to exist proceed as follows:

1. Promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than fourteen days after first observance of the conditions.
2. The Owner and the Architect will review the conditions:
    a. If the Owner and the Architect determines cause for an increase or decrease in the Contract Sum or Contract Time, submit a Change Order Proposal as specified in Section 01 26 00 "Contract Modification Procedures."
    b. If the Owner and the Architect determines that the condition does not change the Contract Sum or Contract Time, the Architect will promptly notify the Owner and Contractor, stating the reasons.
3. If the Contractor disputes the Owner and the Architect's determination, submit a Change Order Proposal as specified in Section 01 26 00 "Contract Modification Procedures."

C. Priority of Construction Space:

1. Coordinate installation of different components to ensure performance and accessibility for required maintenance, service, and repair of components, including mechanical and electrical.
2. Following is the Order of Priority of Construction Space:
    a. First: Ductwork.
    b. Second: Fire protection piping.
    c. Third: Other piping.
    d. Fourth: Conduit.

D. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

F. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data or reproductions of the Contract Documents which in their original, copied, or electronic file form are the Architect's instrument of service and are protected under copyright laws. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Trade Coordination:

1. Drawings contain diagrammatic layouts and indicate general arrangement of systems, piping conduit, etc.
2. Prior to installation of material and equipment, review and coordinate Work with Architectural and Structural Contract Documents for exact space conditions; where not readily discernable, request information from Architect before proceeding.
3. Check Contract Documents of other trades to verify extent of material and equipment to be installed in spaces available and consider layout alternatives so that all requirements can be accommodated.
4. Maintain maximum headroom at locations without finished ceilings.
5. Maintain finished ceiling heights as indicated.
6. Coordinate installations with other trades to prevent conflict with Work of other trades and cooperate in making reasonable modifications in layout as needed.

C. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within

plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for other disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Runs of vertical and horizontal conduit less than 1-1/4 inches (32 mm) in diameter when in groups of 10 or more conduits.
    c. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    d. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
    e. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
    a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Minimum Head Clearance: Provide the bottom elevations of the lowest piping, ductwork, or electrical conduits to confirm clearance.
10. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
11. Coordination Drawing Submittal: Submit coordination drawings electronically according to requirements in Section 01 33 00 "Submittal Procedures."

D. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Submittal Format: Submit or post coordination drawing files using 3D Portable Data File (PDF) format.
3. Architect will furnish Contractor one set of digital data files of Drawings for use in preoaring coordination digital files as specified in related Section 01 11 50 Electronic Drawings.

a. Architect makes no representations as to the accuracy or completeness of digital data files as the related to Drawings.
b. Digital Data Software Program: Drawings are available in AutoCAD format.
c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual or an Agreement form acceptable to Owner and Architect.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project Superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
1. Include special personnel required for coordination of operations with other contractors.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including Superintendent and other personnel in attendance at Project Site. Identify individuals and their duties and responsibilities; list names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to the Project.
1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.7 REQUEST FOR INFORMATION (RFI)

A. Prior to submitting each RFI, first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information to be requested is not reasonably obtainable from such sources.

B. Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, prepare and submit an RFI.

C. Email each RFI as a PDF electronic file to the Architect andcopy the Owner..

D. Submit each RFI sufficiently in advance of the date by which such information is required to maintain the latest construction schedule.

1. Clearly identify the required response time and if the item is critical and requires an expedited review.
2. RFI Item Number: Each RFI should be provided a unique sequential number in three-digit format; such as -001, -002, etc.; this number stays constant on each revision.
3. RFI Revision Number: Each RFI revision should be given a unique sequential number in two-digit format; such as -00, 01, -02, etc.; with -00 as the original RFI.

E. RFI Content: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Name of Architect.
5. Date.
6. Name of Contractor.
7. RFI number, numbered sequentially.

8. RFI subject.
9. Referenced specification section number(s) and title and related paragraphs, as appropriate.
10. Referenced drawing number(s) and detail(s) references, as appropriate.
11. Field dimensions and conditions, as appropriate.
12. Primary Discipline of RFI, based on the following:
    a. Architectural.
    b. Structural.
    c. Mechanical.
    d. Electrical.
    e. Plumbing.
    f. Fire Protection.
    g. Lighting.
    h. AV/Telecom.
    i. Civil.
    j. Landscape.
    k. Other.
13. Indicate if an expedited review is requested.
14. Contractor's suggested resolution.
    a. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
15. Contractor's signature.
16. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

F. RFI Forms: Utilize the form bound in Project Manual or software-generated form with substantially the same content as indicated above, acceptable to Architect, submitted by electronic mail (e-mail).
1. Identify each page with the RFI number and sequential page number.
2. Provide attachments for software-generated forms in Adobe Acrobat PDF format.

G. Contractor shall endeavor to keep the number of RFIs to a minimum.

H. RFIs shall be originated by the Contractor.
1. RFIs from subcontractors or material suppliers shall be submitted through, reviewed by and signed by the Contractor prior to submittal to the Architect and Construction Manager.
2. RFIs from subcontracors or material suppliers sent directly to the Construction Manager of Architect, or to the Architects consultants, shall not be accepted and will be returned unanswered.

I. Contractor shall carefully study the Contract Documents to assure that the requested information is not available therein.
1. RFI’s that request information available in the Contraract Documents will be deemed either ‘improper ‘or ‘frivolous’ as noted above.

J. In instances of RFIs issued requesting a ‘coordination issue’ clarification, Contractor shall include a proposed solution, using drawings or sketches drawn to scale, or photographs annotated to illustrate proposed intent.
   1. RFI’s that request information available in the Contraract Documents will be deemed either ‘improper ‘or ‘frivolous’ as noted above.

K. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
   1. Architect will endeavor to return expedited review requests.
   2. The following Contractor-generated RFIs will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for approval of Contractor's means and methods.
      d. Requests for coordination information already indicated in the Contract Documents.
      e. Requests for adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Architect's actions on submittals.
      g. Incomplete RFIs or inaccurately prepared RFIs.
   3. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
   4. Frivolous RFIs: The Contractor may be invoiced by the Owner for any costs incurred for professional services, which shall be deducted from the next progress payment, for each RFI requesting an interpretation or decision of a matter where the information sought is equally available to the party making such request, or as otherwise defined in this section as frivolous.
      1) Architect will not be responsible for entering information in the Contractor's construction administration system.

L. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include items from "RFI Content" paragraph above.

M. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect to the Owner for Contractor's use during construction.
   1. Upon Contractor's execution of Digital Data Transfer agreement acceptable to the Architect and Owner, Owner will furnish Contractor one (1) set of Digital Data of Drawings for use in preparing coordination Digital Data files.
      a. Subcontractors and other parties granted access by Contractor to Architect’s digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.
   2. Digital Data may be used by Contractor to incorporate additional Digital Data without modifying data received while preparing Coordination Drawings and Shop Drawings.
   3. Digital Data may be used and modified by the Contractor as required to fulfill obligations for delivery of the Project Record Drawings.

4. Architect makes no representations as to the accuracy or completeness of Digital Data files as they relate to Contract Drawings, as such, only the Architect's stamped Construction Documents shall be utilized and relied upon for construction purposes.

B. PDF Document Preparation: Where PDFs are required to by submitted to Architect, prepare as follows:
   1. Assemble complete submittal package into a single, indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
   2. Nake file with Submittal number or other unique identifier, including revision identifier.
   3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate where indicated.

C. Web-Based Project Management Software Package: Provide, administer, and use web-based Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.

   1. Web-based Project management software includes, at a minimum, the following features:

      a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
      b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
      c. Document workflow planning, allowing customization of workflow between project entities.
      d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
      e. Track status of each Project communication in real time, and log time and date when responses are provided.
      f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
      g. Processing and tracking of payment applications.
      h. Processing and tracking of contract modifications.
      i. Creating and distributing meeting minutes.
      j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
      k. Management of construction progress photographs.
      l. Mobile device compatibility, including smartphones and tablets.

   2. Provide up to seven Project management software user licenses for use of Owner, Architect, and Architect's consultants. Provide eight hours of software training for web-based Project software users.
   3. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect and Owner. Provide data in locked format to prevent further changes.

1.9 ARCHITECT’s SUPPLEMENTAL INSTRUCTIONS (ASI)

A. An ASI is a written supplemental instruction issued and signed by the Architect for minor changes to the Work, without change in Contract Sum or Contract Time.

B. Architect Authority:
   1. The Architect has the authority to order minor changes in the Work not involving any adjustment to the Contract Sum, an extension of the Contract Time or a change which is inconsistent with the intent of the Contract Documents.
   2. The Contractor shall carry out such written orders promptly.

1.10 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Conduct a preconstruction conference at the project site or a location and time convenient to the Owner and Architect, before starting construction, but no later than 15 days after execution of the Agreement.

   1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long lead items.
      d. Designation of key personnel and their duties.
      e. Lines of communications.
      f. Use of web-based Project software.
      g. Procedures for processing field decisions and Change Orders.
      h. Procedures for RFIs.
      i. Procedures for testing and inspecting.
      j. Procedures for processing Applications for Payment.
      k. Distribution of the Contract Documents.
      l. Submittal procedures.
      m. Preparation of Record Documents.
      n. Use of the premises and existing building.
      o. Work restrictions.
      p. Working hours.
      q. Owner's occupancy requirements.
      r. Responsibility for temporary facilities and controls.
      s. Procedures for moisture and mold control.
      t. Procedures for disruptions and shutdowns.
      u. Construction waste management and recycling.
      v. Parking availability.
      w. Office, work, and storage areas.
      x. Equipment deliveries and priorities.
      y. First aid.
      z. Security.

aa. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Scheduling: Schedule preinstallation conferences on same day as progress meetings attended by Architect.
2. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
3. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Sustainable design requirements.
i. Review of mockups.
j. Possible conflicts.
k. Compatibility requirements.
l. Time schedules.
m. Weather limitations.
n. Manufacturer's written instructions.
o. Warranty requirements.
p. Compatibility of materials.
q. Acceptability of substrates.
r. Temporary facilities and controls.
s. Space and access limitations.
t. Regulations of authorities having jurisdiction.
u. Testing and inspecting requirements.
v. Installation procedures.
w. Coordination with other work.
x. Required performance results.
y. Protection of adjacent work.
z. Protection of construction and personnel.

4. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
5. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
6. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    a. Preparation of Record Documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Procedures for completing and archiving web-based Project software site data files.
    d. Submittal of written warranties.
    e. Requirements for preparing operations and maintenance data.
    f. Requirements for delivery of material samples, attic stock, and spare parts.
    g. Requirements for demonstration and training.
    h. Preparation of Contractor's punch list.
    i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    j. Submittal procedures.
    k. Coordination of separate contracts.
    l. Owner's partial occupancy requirements.
    m. Installation of Owner's furniture, fixtures, and equipment.
    n. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at regular intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project:

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.

4) Status of submittals.
5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site use.
9) Temporary facilities and controls.
10) Progress cleaning.
11) Quality and work standards.
12) Status of correction of deficient items.
13) Field observations.
14) Status of RFIs.
15) Status of Proposal Requests.
16) Pending changes.
17) Status of Change Orders.
18) Pending claims and disputes.
19) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.11 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

A. The Architect will provide administration of the Contract as the Owner's representative during construction until the date that the Architect certifies the Final Certificate for Payment.

B. The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed.

1. To determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents.
2. The Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work.
3. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the Work.
4. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents

C. Communications: Include the Architect in communications that relate to or affect the Architect's services or professional responsibilities.

1. Communications by and with the Architect's consultants are through the Architect.
2. Communications by and with Subcontractors and suppliers are through the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 ATTACHMENTS

A. Request for Information (RFI) Form

END OF SECTION

Request No.	[XXXXX]	Date	[Month 00, Year]
Project Name	[Project Name]	To	
Project No.	[XXXXXX.XX]		[Address]
Subject	[Subject of RFI]		[City, State, Zip]
		Attention	

Specification Section No. & Paragraph **(Required)**	[Section No. & paragraph]	Drawing & Details Affected **(Required)**	[Drawing & details affected]

Primary Discipline of Request For Information:

☐ Architectural ☐ Structural ☐ Mechanical ☐ Electrical ☐ Plumbing ☐ Fire Protection ☐ Lighting

☐ AV/Telecom ☐ Civil ☐ Landscape ☐ Other

CONTRACTOR'S/BIDDER'S REQUEST (attached referenced documents)

[Write Request Here]

☐ Required to Complete Shop Drawing Submittal ☐ Required to Complete Field Coordination ☐ Required to Complete Bid

CONTRACTOR'S/BIDDER'S RECOMMENDATION

[Write Recommendation Here]

☐ Request has a Potential Schedule Impact ☐ Request has a Potential Cost Impact

CONTRACTOR'S / BIDDER'S REPRESENTATION

Undersigned warrants that Contractor has thoroughly researched the documents, and the information requested does not exist or cannot be ascertained from the information given in the documents.

Contractor's signature and date

_____ _____

Signature Date

A/E RESPONSE

[Write Response Here]

☐ Formal Change Document will be Issued by CannonDesign

☐ Attachments

Architect's signature and date

_____ _____

Signature Date

Distribution: ☐ Owner ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____

☐ Project File

Note: This reply is not an authorization to proceed with work involving additional cost, time, or both. If any reply requires a Change to the Contract Documents, a Change Order, Construction Change Directive, or a Minor Change in the work must be executed in accordance with the Contract Documents.

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Construction Schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Unusual event reports.

B. Related Requirements:
1. Section 01 33 00 Submittal Procedures for submitting schedules and reports.
2. Section 01 40 00 Quality Requirements for submitting a schedule of test and inspections.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of labor and equipment necessary for completing an activity as scheduled.

H. Time: Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

1. The date of commencement of the Work is the date established in the Agreement.
2. The date of Substantial Completion is the date certified by the Architect in accordance with Section 01 77 00 "Closeout Procedures."
3. Day: Refers to a calendar day of contract time, unless otherwise specifically defined.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in PDF file.

B. Startup construction schedule.

1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

D. Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports to contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
3. Total Float Report: List of activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed, unless otherwise indicated in the Owner-Contractor Agreement, until most recent Application for Payment.

F. Construction Schedule Updating Reports: Submit with Applications for Payment.

G. Daily Construction Reports: Submit at [weekly] [monthly] intervals.

H. Material Location Reports: Submit at [weekly] [monthly] intervals.

I. Site Condition Reports: Submit at time of discovery of differing conditions.

J. Unusual Event Reports: Submit at time of unusual event.

K. Qualification Data: For scheduling consultant.

1.4 COORDINATION

A. Coordinate Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from entities involved.
   2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.5 CONSTRUCTION SCHEDULE

A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

B. Scheduling Consultant: To provide planning, evaluation, and reporting, using CPM scheduling.

C. Time Frame: Extend schedule from date established for the Notice to Proceed, unless otherwise indicated in the Owner-Contractor Agreement to date of [Substantial Completion] [Final Completion].
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
   2. Temporary Facilities: Indicate start and completion dates for the following as applicable:
      a. Securing of approvals and permits required for performance of the Work.
      b. Temporary facilities.
      c. Construction of mock-ups, prototypes, and samples.
      d. Owner interfaces and furnishing of items.
      e. Interfaces with Separate Contracts.
      f. Regulatory agency approvals.
      g. Punch list.
   3. Procurement Activities: Include procurement process activities for long lead-time items, including Owner-Furnished/Contractor-Installed (OFCI) items, Owner-Furnished/Owner-Installed (OFOI) items and other major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
      a. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule.
   4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
   5. Commissioning Time: Include no fewer than 15 days for commissioning.
   6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
   7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.

E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.

2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:
    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use-of-premises restrictions.
    f. Provisions for future construction.
    g. Seasonal variations.
    h. Environmental control.

F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion
1. Temporary enclosure and space conditioning.

G. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 01 29 00 "Payment Procedures" for cost reporting and payment procedures.

H. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and the Contract Time.

I. Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Final Completion percentage for each activity.

J. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

K. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.6 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Construction Schedule within 30 days of date established for the Notice to Proceed, unless otherwise indicated in the Owner-Contractor Agreement.

1. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.7 CPM SCHEDULE REQUIREMENTS

A. Prepare network diagrams using AON (activity-on-node) format.

B. CPM Schedule: Prepare Construction Schedule using a[cost- and resource-loaded,] time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than [60] <Insert number> days after date established for the Notice to Proceed, unless otherwise indicated in the Owner-Contractor Agreement.

a. Failure to include any work item required for performance of this Contract will not excuse Contractor from completing all work within applicable completion dates.

2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one day" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.

1.8 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.

4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events.
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. [Construction] [Work] Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

B. Material Location Reports: Prepare and submit a comprehensive list of materials delivered to and stored at Project site. List to be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.2 WORK NOT INCLUDED

A. Submittals which are not required will not be reviewed by the Architect.

B. The Contractor may require subcontractors to provide drawings, setting iiagrams or similar information as part of the coordination of the Work. The Architect willnot review this data.

C. Material Safety and Data Sheets (MSDS) – Limitation of Review: Certain Submittals required provision of these documents by the Contractor. These documents contain information necessary for toperation of the facility. The Architet’s review of these submittals is limited to noting inclusion of the document for the Owner’s use. No further review or comment on MSDS documents by Architect shall be performed or inferred.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

D. Samples: Physical examples that illustrate materials or workmanship, and establish standards by which the Work will be judged.

E. Shop Drawings: Drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

1.4 GENERAL REQUIREMENTS

A. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the

information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals.

B. Refer to Section 01 31 00 "Project Management and Coordination" for the use of Architect's Digital Data Files in the preparation of Shop drawings.

C. Concurrent Submittals: Provide submittals for each specification section concurrently for delivery to Architect unless otherwise specified. Failure to concurrently submit may result in Architect returning submittals without review.

1. Where calculations are required to be submitted, submit concurrently with the initial submittal.

D. Accompany submittals with a completed Submittal Identification Sheet attached to this Section.

1. Submittal Identification Sheet will be the cover sheet for each submittal.
2. Submittals not including Submittal Identification Sheet will be returned as "Not Reviewed."
3. If a Contractor proposes to use their own Transmittal Form in lieu of the Submittal Identification Sheet, the proposed Form must be reviewed by, and determined to be acceptable to, the Architect prior to submitting the first Submittal, and not include less than the information contained within the left side of the Submittal Identification Sheet.

E. Submittals Provided for scope of Work not under Architect's Contract and Delegated Design: The project may require Architects review of submittals for Work prepared under the responsible charge of Design Professionals that are not under the Architect's contract.

1. Provide submittals for work signed and stamped by such design professionals, licensed in the project's jurisdiction, for the Architect's review.
2. Where calculations are required to be submitted, submit concurrently with the initial submittal. Submittals without the required calculations, will be returned without Architect's action.
3. Architect's action will be limited to review for compliance with design concept and contract documents.

1.5 SUBMITTAL SCHEDULE

A. General Requirements:

1. The Architect may withhold action on submittals until the complete Initial Submittal List and Overall Submittal Schedule have been submitted and reviewed.
2. Review of submittals without submission and approval of Initial Submittal List and Overall Submittal Schedule does not relieve Contractor of responsibility to provide Initial Submittal List and Overall Submittal Schedule for approval.
3. Failure to submit either Initial Submittal List or Overall Submittal Schedule relieves Architect of constraints on review periods.
4. Failure to submit an Initial Submittal List, the Overall Submittal Schedule, or to provide submittals in accordance with the Overall Submittal Schedule, will not entitle the Contractor to any increase in Contract Sum or extension of Contract Time.
5. Architect may withhold review of Pay Applications until the complete Initial Submittal List and Overall Submittal Schedule have been submitted and approved.
6. Architect may return submittals as unreviewed if received in advance of the dates indicated in the submittal schedule or those submittals which are not listed in the submittal schedule.

B. Initial Submittal List: Submit to Architect at earliest possible date, but no later than 15 days after Award of Contract, a list of submittals.

1. Format: Arrange the following information in a tabular format:

a. Specification Section number and title.
b. Identification of critical submittals requiring an expedited review process by the Architect.

2. Architect's Action: Note any submittals required to be submitted concurrently for coordination during review.
3. Owner's Action: Note any submittals required to be reviewed by Owner or Owner's Consultants.

C. Overall Submittal Schedule: Submit to Architect concurrently with the Initial Submittal List, an overall submittal schedule, arranged in chronological order by dates required by the construction schedule.

1. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates.
2. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
3. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
4. List those submittals required to maintain orderly progress of the Work and those required early due to long lead time for manufacture or fabrication.

a. Clearly identify those critical submittals that will require an expedited review process by the Architect.
b. Architect’s Action: Approval of the list and timing of critical submittals in relationship to the overall submittal workflow and schedule.

5. Align the submittal sequence to the anticipated sequence of construction.
6. Format: Arrange the following information in a tabular format:

a. Scheduled date for first submittal.
b. Specification Section number and title.
c. Submittal Category: Action; informational.
d. Name of subcontractor.
e. Description of the Work covered.
f. Scheduled date for Architect's final release or review.
g. Scheduled dates for purchasing.
h. Scheduled date of fabrication.
i. Scheduled dates for installation.
j. Activity or event number.

D. Three-Month Look Ahead Submittal Schedule: Submit as an informational submittal, in conjunction with each Pay Application, a detailed submittal schedule covering the next three-month time period, to reflect changes in status and timing for submittals.

1. Pay Applications will not be reviewed without concurrent submission of three-Month Look Ahead submittal schedule.
2. Successive three-month look ahead submittal schedules are a revision of the original submittal.
3. Format: Same as Overall Submittal Schedule.
4. Clearly identify those critical submittals that will require an expedited review process by the Architect.

1.6 SUBMITTAL PROCEDURES

A. Provide submittals required by individual Specification Sections as follows:

1. Submittals: Email as PDF electronic files to the Owner and Architect.

a. Include project name and Submittal Identification Number in subject line of email.
b. Large File Transfer: For files too large for email, transmit using secure file transfer service site and submit transmittal via email to Architect as indicated above, indicating submittal has been uploaded to transfer service site.
c. Submittals received by Architect after 1:00 p.m. will be considered as received the following business day.

2. Certificates and Certifications Submittals:

a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

B. Submittals: Identify and incorporate information in each electronic submittal file. Submittals which fail to conform to the file naming convention will be returned as "Not Reviewed."

1. Index or bookmark submittal for each unique submittal type.
2. Name submittal files per the following protocol: ProjectIdentifierSpecificationSection-SubmittalItem-SubmittalRevision_SubmittalType-Optional Description.

a. Project Identifier: ABA Project number 2111010.
b. Separator: Provide underscore immediately after Project Identifier.
c. Specification Section Number: Only section numbers listed in the Project Manual are acceptable.
d. Submittal Item Number: Each item indicated in specification section as a submittal should be provided a unique sequential number in three-digit format, proceeded by a dash, such as -001, -002, etc.; this number stays constant on a resubmittal.
e. Submittal Revision Number: Each submittal should be given a unique sequential revision number in two-character format, proceeded by a dash, such as -R1, -R2, etc., which modifies the original number of -00.
f. Separator: Provide underscore immediately after Submittal Revision Number.
g. Submittal Type: Two-character submittal type identifier per schedule below:

1) PD: Product Data
2) SD: Shop Drawing
3) DD: Delegated Design
4) LD: Sustainable Design Submittal or LEED Submittal
5) MW: Manufacturer's Warranty
6) ER: Evaluation Reports
7) PT: Product Lab Test Reports/Data
8) FR: Field Test Report
9) MS: Material Sample
10) PC: Product Certification
11) CC: Contractor Certification/Qualification
12) IC: Installer Certification
13) IN: Installation Certification
14) QD: Qualification Data
15) MI: Manufacturer's Installation Instructions
16) OM: Operations and Maintenance Data/Manuals
17) RD: Record Documents

h. Optional Description: Up to 25-character optional description of the submittal, separated from the Submittal Type by a dash.

1) Example: -Structural Steel Seq A.

3. Submittals that fail to conform to the file naming convention will be returned as "Not Reviewed."
4. Example of File Naming Protocol for submittals from Section 05 54 00:

a. Action Submittals:

1) Product Data: "Project Identifier"_05 54 00-001-00_PD-CFMF.
2) Shop Drawings: "Project Identifier"_05 54 00-003_SD-CFMF.
3) Delegated-Design Submittal: "Project Identifier"_05 54 00-004-00_DD-CFMF-CFMF Delegated Design.

b. Informational Submittals:

1) Welding Certificates: "Project Identifier"_05 54 00-005_IC-CFMF Welding Cert.
2) Qualification Data: "Project Identifier"_05 54 00-006-R2_QD-CFMF Qual Data.
3) Product Test Reports: "Project Identifier"_05 54 00-007-00_PT-CFMF Test Reports.

C. Options: Identify options requiring selection by Architect.

D. Deviations and Additional Information: On attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

1. Deviations: Encircle or otherwise specifically identify deviations from Contract Documents on submittals.

E. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit submittal Items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect will return a submittal as "Not Reviewed" on a submittal requiring coordination with other submittals until related submittals are received.

F. Processing Time: Allow sufficient time for Architect's review of submittals as determined by Architect. After review and approval of submittal schedule, allow time for submittal review, including time for resubmittals, as follows. Time for review commences on Architect's receipt of submittal. Submittals received by Architect after 1:00 p.m. will be considered as received the following working day. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal except for critical submittals identified and agreed to by the Architect on the approved Submittal Schedule. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal, or as indicated by Architect on approved Submittal Schedule.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal, or as indicated by Architect on approved Submittal Schedule.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect, before being returned to Contractor.

    a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "No Exceptions Taken" or "Make Corrections Noted" and initialed by Architect.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.7 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's product specifications, including performance characteristics written to match specified terminology for ease of comparison.
    b. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

        1) Preparation of substrates.
        2) Required substrate tolerances.
        3) Sequence of installation or erection.
        4) Required installation tolerances.

5) Required adjustments.
6) Recommendations for cleaning and protection.

c. Standard color charts.
d. Manufacturer's catalog cuts.
e. Wiring diagrams showing factory-installed wiring and controls.
f. Printed performance curves.
g. Operational range diagrams.
h. Mill reports.
i. Standard product operation and maintenance manuals.
j. Statement of compliance with specified referenced standards.
k. Testing by recognized testing agency.
l. Application of testing agency labels and seals.
m. Notation of coordination requirements.
n. Availability and delivery time information.
o. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
p. Additional information as required by Specifications.

4. Submit Product Data before or concurrent with Samples.
5. Submit Product Data as a PDF electronic file.
6. Safety Data Sheets (SDS) and Material Safety Data Sheets (MSDS): Submit information directly to Owner; do not submit to Architect.

a. Architect will not review submittals containing SDS or MSDS sheets, unless otherwise required.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.
h. Additional information as required by Specifications.

2. Do not include the phrase "by others," except when relating to materials, products or equipment not included in the Work of the Contract.
3. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheet layouts of at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
4. Submit Shop Drawings in the following format: PDF electronic file.
5. Paper Submittals: Prepare submittals in paper form only when directed by Architect and prepare as required per "Submittal packaging" article.

a. For 8-1/2 by 11-inch (215.9 by 279.4 mm) shop drawings in excess of 20 pages, submit two (2) full size hard copies, in addition to the electronic PDF file. Architect will return only the annotated electronic PDF file.
b. For 11 by 17-inch (279.4 by 431.8 mm) shop drawings in excess of 20 pages submit two (2) full size hard copies, in addition to the electronic PDF file. Architect will return only the annotated electronic PDF file.

c. For shop drawings larger than 11 by 17-inch (279.4 by 431.8 mm) format, submit two (2) full size hard copies, in addition to the electronic PDF file. Architect will return only the annotated electronic PDF file.

6. Submittals will be clear and legible. The Architect reserves the right to reject in full any submittal due to illegibility, as determined solely by the Architect, without any impact to the allowed review time. Dimensions and text will be a minimum of 10-point font or 0.389 inches (9.88 mm) in height. Drawings not conforming to this requirement will be rejected without review.

C. Coordination Drawings: Refer to Division 01 Section "Project Management and Coordination" for requirements for coordination drawings.

D. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Indicate name of firm or entity that prepared each submittal on label or title block.
b. Project name and submittal number.
c. Generic description of Sample.
d. Product name and name of manufacturer.
e. Sample source.
f. Number and title of applicable Specification Section.
g. Specification paragraph number and generic name of each item.

3. Provide corresponding electronic submittal including "Submittal Identification Sheet," digital image file of the Sample concurrent with submission of physical sample.

a. Received date by Architect will correspond with receipt of physical submittal.

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials;

swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample set; the remainder will be returned. The Contractor is required to retain one returned Sample set as a project control Sample.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications will be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

G. Test and Research Reports: Schedule tests and reports in accordance with Division 01 Section "Quality Requirements" and as follows:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base

reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

6. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

    a. Name, address, and telephone number of factory-authorized service representative making report.
    b. Statement on condition of substrates and their acceptability for installation of product.
    c. Statement that products at Project site comply with requirements.
    d. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
    e. Results of operational and other tests and a statement of whether observed performance complies with requirements.
    f. Statement whether conditions, products, and installation will affect warranty.
    g. Other required items indicated in individual Specification Sections.

7. Research/Evaluation Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

1. Do not perform a portion of the Work for which the Contract Documents require submittals and review until the respective submittal has been approved by the Architect.
2. Contractor to verify, prior to submission:

    a. Field Measurements.
    b. Field Construction Criteria.
    c. Catalog Numbers and Similar Data.
    d. Quantities.
    e. Coordination with other requirements.

3. Contractor's responsibility regarding errors and omissions in submittals is not relieved by Architect's review of submittals.
4. Contractor's responsibility regarding deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals, unless Architect gives written acceptance of specific deviations as approved by Owner.
5. When work is directly related and involves more than one trade, coordinate submittal with other trades and submit under one cover.

6. After a submittal has been submitted for review, no changes may be made to that Submittal other than changes resulting from review notes made by the Architect unless such changes are clearly identified and circled before being resubmitted. Any failure to comply with this requirement will nullify and invalidate the Architect's review.

B. Approval Stamp: Stamp each Submittal Identification Form with Contractor's stamp certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1.9 ARCHITECT'S ACTION

A. The Architect will review or take other appropriate action upon the Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

1. Review of submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, which remain the responsibility of the Contractor.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will indicate on "Submittal Identification Sheet" for each submittal to indicate action taken, as follows:

1. "Reviewed":

a. No further review of submittal is required.

2. "Furnish as Corrected":

a. If Contractor complies with noted corrections, fabrication may proceed and resubmission is not required, unless otherwise noted.
b. If for any reason the Contractor cannot comply with the noted corrections, fabrication shall not proceed and Contractor shall resubmit, following procedures outlined hereinbefore.

3. "Revise and Resubmit":

a. Contractor shall revise and resubmit for review. Fabrication shall not proceed.

4. "Rejected":

a. Submittal is not in compliance with the Contract Documents and is not acceptable. Provide new submittal.

C. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

F. Architect will return without review submittals received from sources other than Contractor.

G. Submittals not required by the Contract Documents will be returned by Architect with the "Not Required for Review" action taken.

H. Submittals Provided for scope of Work not under Architect's Contract or Delegated Design: Architect will review each submittal, make marks to indicate compliance with Design Concept and Contract Documents only, and return it. Architect will indicate on Submittal Identification Sheet for each submittal to indicate action taken, as follows:

1. "Submittal is in Compliance with Design Concept and Contract Documents."
2. "Submittal is NOT in Compliance with Design Concept and Contract Documents."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

END OF SECTION

SECTION 01 35 35 – CONSTRUCTION INDOOR AIR QUALITY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes construction Indoor Air Quality (IAQ) goals and includes administrative and procedural requirements for the development and execution of a construction air quality management plan to maintain the highest indoor air quality during the Work and following completion of it.

1.2 PERFORMANCE REQUIREMENTS

A. The Contractor shall apply their greatest skill and attention to anticipate and prevent conditions that could compromise indoor air quality during and following construction due to construction means, methods, process, sequence and materials. Particular attention shall be given to the following.
   1. Eliminating the use of materials containing Volatile Organic Compounds (VOC), formaldehyde and certain chemical compounds for which limitations are specified in an attachment to Section 01 60 00 and select construction materials and processes that will eliminate potential IAQ pollutants and contaminants from the Work.
   2. Protect the ventilation system components during construction and clean contaminated components after construction is complete.

B. Contractor's IAQ Management Plan shall conform to recommendations of SMACNA Guidelines for Occupied Buildings under Construction, Chapter 3 Control Measures for the following.
   1. HVAC protection.
   2. Source control.
   3. Pathway interruption.
   4. Housekeeping.
   5. Scheduling.

1.3 SUBMITTALS

A. IAQ Management Plan for the construction and pre-occupancy phases of the project.

B. Construction Photographs: Digital, color images, 640 by 480 pixels on CD-ROM documenting construction IAQ management measures implemented during the Work such as duct protection measures and measures to protect on-site stored or installed absorptive materials from moisture. Provide annotation for images including date, time and subject.

C. Product Data: Filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted.

1.4 QUALITY ASSURANCE

A. Indoor Air Quality Management Plan: For the construction and pre-occupancy phases of the Project provide the following as a minimum.

1. Construction Period: Meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction.
2. Protect stored and installed absorptive materials from exposure to moisture and where practical provide conditioning period in controlled environment to reduce moisture content of materials where protection failed or was otherwise ineffective.
3. Conduct a minimum two-week building flush-out following Substantial Completion of the Work and prior to Final Acceptance.
4. HVAC Protection: Shut down the return side of the HVAC system whenever possible during heavy construction. If the system must remain operational during construction include the following strategies that apply:
    a. Fit the return side of the HVAC system with temporary filters.
    b. Isolate the return side of the HVAC system from the surrounding environment as much as possible (e.g., place all tiles for the ceiling plenum, repair all ducts and air handler leaks).
    c. Damper off the return system in the heaviest work areas and seal the return system openings with plastic.
    d. Upgrade the filter efficiency where major loading is expected to affect operating HVAC system.
    e. Clean permanent return air ductwork per National Air Duct Cleaning Association standards upon completion of all construction and finish installation work.
    f. Install new clean media just prior to substantial completion and occupancy that has a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999.
5. Source Control: Provide non-toxic formulations of materials and products and comply with chemical compound limitations throughout the work including but not limited to adhesives, coatings, substrate products, sealants, and cleaning products.
6. Pathway Interruption: Prevent contamination of clean spaces. Include the following strategies that apply:
7. Use 100 percent outside air ventilation (when outside temperatures are between 55 degrees F and 85 degrees F and humidity is between 30 and 60 percent) with air exhausted directly to the outside during installation of finishes and other VOC emitting materials.
8. Erect some type of barrier between work areas or between the inside and outside of the building to prevent unwanted airflow from dirty to clean areas.
9. Housekeeping: Reduce construction contamination in the building prior to occupancy through HVAC and regular space cleaning activities.
    a. Store building materials in a weather tight, clean area prior to unpacking for installation.
    b. Check for possible damage to building materials from high humidity.
    c. Clean all coils, air filters, and fans before testing and balancing procedures are performed.
10. Agenda items for discussion and monitoring of IAQ procedures and maintenance at Periodic Progress Meetings.
    a. Schedule coordination for flush out field quality control for IAQ testing/monitoring.

B. Scheduling: Specify construction sequencing to reduce absorption of VOC’s by materials that act as sinks or contaminant sources. Complete application of wet and odor-emitting materials such as paints, sealants, and coatings before installing sink materials such as ceiling tiles, carpets, insulation, gypsum products, and fabric-covered furnishings are installed.

1. Protect stored on-site or installed absorptive materials from exposure to moisture through precipitation, plumbing leaks, or condensation from the HVAC system to prevent microbial contamination.
2. Conduct a two-week building flush-out with new filtration media at 100% outside air after construction ends and prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999. Replace filtration media used during flush-out prior to occupancy.

C. Draft IAQ Management Plan Review Meeting: Once the Owner and Architect have reviewed the Draft IAQ Management Plan and prior to construction at the site, schedule and conduct a meeting to review the Draft IAQ Management Plan and discuss procedures, schedules and specific requirements for IAQ during the construction and pre-construction phases of the building. Discuss coordination and interface between the Contractor and other construction activities. Identify and resolve problems with compliance to the requirements. Record minutes of the meeting, identify all conclusions reached and matters requiring further resolution.
1. Attendees: The Contractor and related Contractor personnel associated with the work of this Section, including personnel to be in charge of the IAQ management program, Architect, Owner and such additional personnel as the Architect or Owner deem appropriate.

D. Final IAQ Management Plan: Make any revisions to the Draft IAQ Management Plan agreed upon during the meeting identified in item (C) above and incorporate resolutions agreed to be made subsequent to the meeting. Submit the revised plan to the Owner and Architect for approval within 10 calendar days of the meeting.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 APPLICATION

A. Manager: The Contractor shall designate an on-site party (or parties) responsible for instructing workers and overseeing and the IAQ Management Plan for the Project.

B. Progress Meetings: Construction related IAQ procedures shall be included in the pre-construction and construction progress meeting agendas.

C. Distribution: The Contractor shall distribute copies of the IAQ Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Architect.

D. Instruction: The Contractor shall provide on-site instruction of the IAQ procedures and ensure that all participants in the construction process understand the importance of the goals of the IAQ Management Plan.

END OF SECTION

SECTION 01 35 73 - DELEGATED DESIGN PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes procedures for portions of Work under this Contract that are defined as Delegated Design components and systems in applicable Sections.

1.2 DEFINITIONS

A. Delegated Design: Professional design service or certification specifically required of the Contractor in Sections of the Project Manual.

B. Contractor's Design Professional: Design Professional registered in the State in which the Project is located and engaged by Contractor, subcontractor, or supplier to provide drawings, calculations and specifications required for Delegated Design components and systems.

C. Delegated Design Submittal: Submittal prepared by Contractor for work as specified.

D. Deferred Submittal: Construction documents for those components of the Work that cannot be fully detailed on the approved construction documents because of variations in product design and manufacture and have been specifically approved by the AHJ for submittal review and approval after original permit approval.

E. AHJ: Authorities Having Jurisdiction.

F. Seal: Certification that drawings, calculations, and specifications were designed and prepared under direct supervision of Architect or Professional Engineer whose name appears on the submittal.

1.3 GENERAL REQUIREMENTS

A. Delegated Design Components and systems: Refer to individual Project Manual Sections for work requiring Delegated Design.

B. Performance and Design Criteria for Delegated Design Criteria: Provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

2. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by the Contractor's design professionals.

C. Delegated Design components and systems shown in Contract Documents are shown for design intent. Contractor is responsible for designing, providing, coordinating, and installing Delegated Design components including specified products.

1. Where Delegated Design components and systems are attached to structural frame or supplemental to structural frame, design for anticipated loads specified on structural drawings, inherent gravity loads supported by system and coordinated with Contractor, and other loads included in applicable codes.
    a. Clearly define load reactions at interface between Delegated Design components and systems and structural frame to allow for review by Engineer of Record.
2. Design non-structural components and systems in compliance with applicable regulations, performance criteria, and submittal requirements as specified in the respective sections.
3. Coordinate Delegated Design components and systems with appropriate subcontractors.

D. Pre-Submittal Meeting: Meet with Architect, subcontractors, and Contractor's Design Professional to discuss requirements of work, submittals, scheduling, and sequencing of Delegated Design components and systems.

1.4 RESPONSIBILITIES

A. Contractor's Responsibilities:

1. Provide services or certifications by Contractor's Design Professional.
2. Include costs for Delegated Design in Contract Sum, including Contractor Design Professional fees, testing and inspection reports, documentation and shop drawings, field reviews and field review reports, and letters of general conformity.
3. Coordinate and assume complete responsibility for design, documentation, calculations, submittals, permits, fabrication, transportation, and installation of components requiring Delegated Design.
4. Coordinate components requiring Delegated Design with adjacent or related systems, whether included in Contract Documents or other Delegated Design components. Ensure complete and operational systems designed to perform their intended use are provided.
5. Ensure Delegated Design executes design intent indicated in the Contract Documents. and meets or exceeds requirements of applicable codes, standards, regulations, of the Contract Documents.
6. Where specified, submit Delegated Design documents to AHJ for review, in a manner that will not adversely affect Project's construction schedule.

B. Contractor's Design Professional: Design Professional engaged by Contractor, or Contractor's subcontractor or supplier, to provide drawings, calculations, reports, tests, and specifications required for Delegated Design components and systems in accordance with criteria specified in Contract Documents, including documentation required by AHJ when required. Responsibilities of Contractor's Design Professional include, but are not limited to, the following:

1. Preparation of Delegated Design Submittals:
    a. For structural applications, refer to Structural Drawings or applicable Specification Sections for structural performance criteria. Include provisions for wind, gravity, lateral, and seismic loads and include design for life safety, sizing of supports, anchors, framing, connections, spans, and other required characteristics.
    b. For non-structural applications, comply with performance criteria and AHJ requirements specified in applicable Section.
    c. Where calculations are required, submit at the same time as initial submittal.

2. Periodic field review of Delegated Design work:

   a. Provide Contractors Design Professional field reviews at intervals necessary and appropriate to progress of the Work to allow to be familiar with progress and quality of Work and to determine if work covered by Delegated Design is proceeding in general conformity with the Delegated Design submittal and Contract Documents, including reviewed shop drawings and design calculations. Provide field review report within 3 days of field review.
   b. Review of associated mock-ups and off-site fabrication where applicable. Submit field review report within 3 days after each mock up and offsite fabrication visit to Architect and AHJ as required by applicable building codes.
   c. Upon completion of Delegated Design components of the Work, prepare and submit to Architect, and AHJ as required, a letter of general conformity for Delegated Design components of the Work, certifying that they have been supplied and installed in accordance with the requirements of the submittal, AHJ and Contract Documents.

1.5 SCHEDULING

A. Schedule design process and submittals required for Delegated Design portions to comply with Project Construction Schedule.

   1. Allow sufficient time for Architect, Architect's consultants, and where applicable, AHJ, review of Delegated Design submittals. Include time estimate and coordination of schedule for review of Delegated Design submittals provided by Architect.

B. When Delegated Design submittal is included in documents submitted for building permit, schedule and sequence Architect's review of Delegated Design submittal prior to permit submittal.

C. Owner is not responsible to pay for any delays, additional products, additional hours of Work, or overtime, restocking or rework required due to failure by Contractor or subcontractor to coordinate their Work with Work of other trades on Project or to provide Delegated Design component and system in a timely manner to meet project schedule.

1.6 ACTION SUBMITTALS

A. Delegated Design Submittal Schedule: In compliance with the Submittal Schedule specified in Section 01 33 00 "Submittal Procedures."

B. Progress Submittal: Submit preliminary drawings and product data prior to performing engineering calculations and shop drawings.

C. Final Submittal: Submit final Delegated Design documents to Architect and AHJ as required for review and approval based on submittal schedule as specified in Section 01 33 00 "Submittal Procedures." Include the following:

   1. Complete criteria.
   2. Design assumptions.
   3. Details.
   4. Calculations for required engineering, including but not limited to, structural, mechanical, plumbing, fire protection, and electrical work as applicable.
   5. Reactions to structure where applicable.
   6. Submittal stamped and signed by Contractor's Design Professional responsible for preparation of submittals.
   7. Instructions for fabrication, assembly, installation, and interface with other trades.

1.7 INFORMATION SUBMITTALS

A. Subcontractor and Contractor's Design Professional List: Submit list of Delegated Design subcontractors and Contractor's Design Professionals in accordance with requirements specified in Division 01 Section "Submittal Procedures" for Subcontract List.

1. Submit Subcontractor and Contractor's Design Professional list to AHJ, when required.

B. Field Review Reports: By the Contractor's Design Professional.

C. Certifications: From the Delegated Design Professional certifying the Work is in accordance with the design criteria.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

D. Engineer Qualifications: For Delegated Design Professional's qualifications.

1.8 PROCEDURES FOR DELEGATED DESIGN SUBMITTALS

A. Comply with requirements for submittals as specified in Section 01 33 00 "Submittal Procedures."

1. Submit Delegated Design documents for approval prior to fabrication.
2. Comply with Delegated Design submittal schedule.

B. Progress Submittal Process: Provide progress submittal to Architect approximately 4 weeks prior to final submittal. Submit Progress Submittal prior to performing engineering calculations.

1. Progress Submittal Contents:

a. Narrative reflecting understanding of basis of design for delegated design work, including structural and thermal performance.
b. Design drawings showing critical details.
c. Proposed list of initial submittal documents.
d. Engineer's qualifications.

2. Documents will be reviewed by Architect for consistency with specified criteria. Corrections, if any, will be identified and returned to Contractor.
3. Clearly identify deviations and proposed alternates to materials and systems specified in this Project Manual.

C. Final Submittal Process:

1. Submit final and complete Delegated Design documents to Architect as required for review and approval.
2. Complete submittal will be reviewed by Architect for consistency with specified criteria. Corrections, if any, will be identified and returned to Contractor.
3. Contractor makes corrections and returns submittal to Architect within one week of receipt.
4. No contract time extensions will be granted for document modification caused by non-conformance with specified criteria.
5. AHJ Review:

a. Once reviewed and approved by Architect, Architect submits documents to AHJ for review and comment.
b. Architect will receive AHJ comments and forward to Contractor.

c. Do not contact AHJ directly to discuss submittal without Architect's prior approval. If approval given, copy Architect on correspondence and meeting reports.
d. After submittal receives AHJ final approval, Architect provides one copy of stamped sets for Contractor's fabrication and construction.
e. Take steps required to obtain AHJ approval, including submittal changes or corrections required by AHJ and provide coordination and management necessary to obtain AHJI approval, including resubmittals, meetings where required by Architect, correspondence, and communications.

1.9 SUBMITTAL PROCEDURES FOR DEFERRED APPROVALS

A. Documentation: Where portion of construction cannot be adequately detailed on approved plans due to variations in product design and manufacture, approval of submittal for such portion, when specifically accepted by AHJ, may be deferred until material suppliers are selected:

1. Project Drawings clearly indicate that deferred approval by AHJ is required for indicated portions of work prior to fabrication and installation.
2. Contract Documents define performance criteria for deferred approval.
3. Contractor's Architect or Engineer shall stamp and sign Drawings and Specifications for deferred approval items.

a. The Architect or Engineer in general responsible charge of design of Project will submit Drawings and Specifications for deferred approval item to AHJ, with notation indicating that deferred approval documents have been found to be in general conformance with performance criteria.

1.10 ARCHITECTS ACTION

A. Architect's review of Delegated Design submittals will indicate compliance with Design Concept and Contract Documents only. Architect will indicate action taken on "Delegated Design Submittal Identification Sheet" for each submittal as follows:

1. "Submittal is in Compliance with Design Concept and Contract Documents".
2. "Submittal is NOT in Compliance with Design Concept and Contract Documents"

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Services of testing laboratories and Special Inspectors as specified are intended for the Owner's verification of the Contractor's compliance with the requirements of the Contract Documents. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements or relieve the Contractor of the responsibility for compliance with the Contract Document requirements.
4. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
5. The services and quantities of testing specified are approximate and may vary. Actual services and quantities of testing will be determined by the Owner**,** and/or Architect , and Commissioning Authority during the construction period.
6. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

A. Delegated Design: Refer to definitions and requirements for Delegated Design in Section 01 35 73 "Delegated Design Procedures."

B. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

C. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

D. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

E. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

F. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

G. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

H. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

J. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

K. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.5 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.

B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager may also serve as Project superintendent.
2. .

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
3. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.6 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements, and identification of source of failure and consideration for repair.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner’s records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgements, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following.

1. Contractor's responsibilities, including the following:
    a. Provide test specimens representative of proposed products and construction.
    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    d. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
    e. When testing is complete, remove test specimens and test assemblies and mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed work:
1. Build mock-ups in location and of size indicate or, if not indicated, as directed by the Architect.
2. Notify the Architect seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mick-up construction. Employ workers that will be employed during the construction of the Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect’s approval of mock-ups before starting work, fabrication, or construction.
    a. Allow seven days for initial review and each re-review of each mock-up.
6. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mock-ups when directed unless otherwise indicated.

L. Integrated Exterior Mockups: Construct integrated exterior mock-up according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Spec Sections, along with supporting materials.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Engage a qualified testing agency to perform quality-control services.

    a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect, Commissioning Authority and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor, identifying of source of failure and consideration for repair.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."

E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

F. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspection equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.

1. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Test and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality control service to Architect and Commissioning Authority with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special test and inspections at Substantial Completion, which includes a list of unresolved deficiencies.

5. Interpreting test and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare and maintain a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

J. "Contract Limit": Space available for performing construction activities; the primary area of Work may be indicated by a Limit of Construction line on Drawings but Work necessary to complete the Project can also occur beyond this limit. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

K. "Remove": Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

L. "Remove and Salvage": Detach items from existing construction and deliver them to Owner.

M. "Salvage": Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner. Include fasteners or brackets needed for reattachment elsewhere.

N. "Remove and Reinstall": Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

O. "Existing to Remain": Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

P. "Demolish": Tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or a free-standing machinery or equipment that is directly related to the function of the structure.

Q. "Recycle": Recovery of demolition waste for subsequent processing in preparation for reuse.

R. "Permanent Enclosure": As determined by Architect, the condition at which roofing is insulated and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

5. CBC-California Building Code.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
   1. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
   2. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
   3. EPA - Environmental Protection Agency; www.epa.gov.
   4. OSHA - Occupational Safety & Health Administration; www.osha.gov.

D. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
   1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
   2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
   3. CDHS; California Department of Health Services; (See CDPH).
   4. CDPH; California Department of Public Health; Indoor Air Quality Program;www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/Main-Page.aspx.
   5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
   6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.

1.4 REPORTING AND RESOLVING DISCREPANCIES

A. Report in writing at once to Owner, with copies to Architect, all conflicts, errors, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and provisions of laws or regulations applicable to the performance ot the Work or of standards, specifications, manual, codes or instructions of manufacturers or suppliers. Do not proceed with the Work affected until directions to do so is given by the Architect.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 USE CHARGES

A. General: Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Arrangements for Site Utility Usage:
   1. Water and Sewer Service from Existing System: Water from Owner’s existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
   2. Electric Power Service from Existing System: Electric power from Owner’s existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Implementation and Termination Schedule: Within [**15**] <**Insert number**> days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

D. Site Safety Plan: Show detailed site safety requirements, in compliance with OSHA, AHJ, and Owner requirements, including, but not limited to, the following:

   1. Safety goals statement.
   2. Construction site rules and regulations.
   3. List of responsible personnel.
   4. Operating procedures and safety precautions.
   5. Extreme weather conditions.
   6. Emergency contact information.
   7. Reporting instructions and procedures.
   8. Personal Protective Equipment (PPE) requirements for staff and visitors on site.

E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

F. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.

1. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
4. Indicate methods to be used to avoid trapping water in finished work.
5. Document visible signs of mold that may appear during construction.
6. Basement: Monitor below grade spaces and crawlspaces for humidity

G. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste-handling procedures.
5. Other dust-control measures.

H. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:

1. Methods used to meet the goals and requirements of the Owner.
2. Concrete cutting method(s) to be used.
3. Location of construction devices on the site.
4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.

I. Protection of Air Resources Plan: Not less than 10 days before the Pre-construction meeting, prepare and submit a plan that identifies controls to limit disturbance on site and site dust limitation.

1. Make record within each daily report of non-road, on-road diesel equipment and diesel generators present on site; and for first occurrence of diesel equipment's appearance, provide record that compliance documents have been reviewed and certified by Contractor.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pavement: Comply with [**Section 32 12 16 "Asphalt Paving."**] [**Section 32 13 13 "Concrete Paving."**] [**Division 32 pavement Sections.**]

B. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.

C. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.

D. Wood Enclosure Fence: Plywood, [6 feet (1.8 m)] [8 feet (2.4 m)] high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart.

E. Lumber and Plywood: Comply with requirements in Section [06 10 00 **Rough Carpentry**] [**061053 Miscellaneous Rough Carpentry**].

F. Gypsum Board: Minimum 1/2 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.

G. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.

H. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches (914 by 1524 mm).

I. Insulation: Unfaced mineral-fiber blanket, manufactured from rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices:

1. Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-(1.2-m-) square tack and marker boards.
   2. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Personal Protective Equipment (PPE): Provide standard PPE for visitors on site, including hard hats, protective eyewear, high visibility vests, and gloves.

B. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   1. Locate facilities to limit site disturbance as specified in Section 01 11 00 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to as directed by authorities having jurisdiction.

C. Water Service:

1. Install water service and distribution piping in sizes and pressures adequate for construction.
2. Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities [will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use].

E. Electric Power Service:

1. Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

G. Telephone Service: Provide temporary telephone service in common-use facilities for use by construction personnel. Install Wi-Fi cell phone access equipment and one land-based telephone line(s) for each field office.

1. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Contractor's emergency after-hours telephone number.
e. Architect's office.
f. Construction Manager's home office.
g. Engineers' offices.
h. Owner's office.
i. Principal subcontractors' field and home offices.

H. Electronic Communication Service: Provide secure Wi-Fi wireless connection to internet with provisions for access by Architect and Owner.

I. Project Computer: Provide a computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

3.4 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
2. Utilize designated area within existing building for temporary field offices.
3. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Section 31 23 16 "Earth Moving."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Section 32 12 16 "Asphalt Paving."

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Provide temporary parking areas for construction personnel.

E. Protection of Air Resources: Comply with requirements of authorities having jurisdiction.

1. Prevent creation of dust, air pollution, and odors.
2. Sequence construction to avoid disturbance to site to the greatest extent possible.
3. Store volatile liquids, including fuels and solvents, in closed containers.
4. Properly maintain equipment to reduce gaseous pollutant emissions.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs, so they are legible at all times.

H. Waste Disposal Facilities:

1. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

K. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas, so no evidence remains of correction work.

L. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

M. Existing Structures: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement or collapse of construction and finishes to remain.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 01 10 00 "Summary."

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

D. Noise Control: Perform construction operations to minimize noise. Perform noise-producing work in less sensitive hours of the day or week as directed by Owner.

1) More than 12 minutes in any hour: 70 dB.
2) More than 3 minutes in any hour: 80 dB.

E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

F. Tree and Plant Protection:

1. Comply with requirements specified in Section 01 56 39 "Temporary Tree and Plant Protection."
2. Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.

I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

K. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

L. Covered Walkway: Erect structurally adequate, protective, covered walkway for passage of individuals through or adjacent to Project site, including public sidewalks and streets. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.

1. Provide wood-plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
2. Paint and maintain appearance of walkway for duration of the Work in a manner approved by Owner and Architect.

M. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

N. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard and replace stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

a. Remove and replace materials that cannot be completely restored to their manufactured moisture level within [**48**] <**Insert time period**> hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Operate Project-Identification signage lighting from dusk until 12:00 midnight.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, Special Conditions and Division 1.

B. Related Work Specified Elsewhere:
1. General Contract Conditions.
2. Division 2 Section “Selective Demolition.”
3. Division 31 Sections “Site Clearing”.
4. Tree relocation program for palm trees.

1.2 CONDITIONS AND REQUIREMENTS

A. Prior to any demolition on the site, Contractor shall provide the Owner’s Representative with evidence of a contract with an ISA (International Society of Arboriculture) Certified Arborist who will be responsible for supervising implementation of the tree and plant protection measures described herein.

B. Protection and welfare of all existing trees within the Contract Limits which are noted to remain, including trimming, cabling, and repair of such trees as necessary as shown on the Drawings and as specified throughout the entire construction period.

C. Contractor shall submit tree maintenance plan for Owner’s Representative's approval.

D. Provide monthly tree maintenance reports for review by Owner’s Representative.

E. Protection of any existing irrigation system servicing trees to remain.

F. Completely coordinate with all work.

1.3 DEFINITIONS

A. "Injury" is defined, without limitation, as any bruising, scarring, tearing, or breaking of roots, branches, or trunk.

B. "Drip line" is defined as the outermost limits of the tree canopy.

1.4 QUALITY ASSURANCE

A. General Responsibility: The Contractor shall be directly responsible for protection and welfare of existing trees within the Contract Limits which are noted to remain. This responsibility shall continue throughout the full construction period until the entire project is completed and accepted by the Owner and through completion of the guarantee period.

B. Qualifications of Workmen: Trimming shall be performed only by an ISA (International Society of Arboriculture) certified arborist. Provide at least one (1) person approved by the Owner's Representative who shall be present at all times during tree protection and trimming operations, who shall be thoroughly familiar with the type of work involved, and who shall direct all protection and trimming work.

C. Reference Standards: Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work of this section.

D. International Society of Arboriculture (ISA) "Plant Appraisal", 8th edition, prepared by the Council of Tree and Landscape Appraisers (CTLA).

1.5 JOB CONDITIONS

A. Prior to performing any work of this Contract, Contractor shall call for a site meeting with the Landscape Architect and representatives of the Owner. This meeting shall occur prior to construction of any nature on site. The purpose of the meeting shall be to establish the conditions of all existing trees to be preserved upon receipt of the site by the Contractor.

1.6 GUARANTEE

A. Contractor shall guarantee that all plants covered by the provisions of this Section will be healthy and in flourishing condition of active growth one (1) year from the date of Substantial Completion.

B. During the warranty period the Contractor shall be liable for damages to all trees covered by the provisions of this Section and shall pay compensation to the Owner. Compensation to the Owner shall be as outlined in Paragraph 3.6.

C. Contractor will not be held responsible for failures due to neglect by the Owner, vandalism, etc., during the warranty period. Report such conditions to the Owner's Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Use only new materials of brands and types noted on the Drawings, specified herein, or equal.

2.2 TREE PROTECTION FENCING

A. Tree Protection Fence: As described in drawing notes. If not provided on drawings tree fence to be eight (8) foot high chain link fence, sturdy and capable of acting as a barrier against objects, vehicles, etc., and designed so as to allow for relocations as required and shall have gate access to inside for care of tree. It shall be continuously maintained and repaired as necessary. Metal shall be galvanized.

B. Install tree protection fencing around trees to be preserved at a distance required from the base of the trunk to the drip line of the tree. Fencing shall remain until landscape work has commenced, and it shall then be removed as directed by the Owner's Representative.

C. During the course of construction, relocation of the fence may be required to facilitate construction. The Contractor shall do so as directed by the Owner's Representative at no additional expense to the Owner.

PART 3 - EXECUTION

3.1 PROTECTION OF TREES

A. Water: Provide ample water supply of potable quality and sufficient quantity for all operations required under this Section.

B. The existing trees to be preserved presently are in excellent condition. Trees shall not be allowed to deteriorate and shall be maintained in a healthy and vigorous condition during the course of construction and Maintenance Period.

C. During the course of construction the Contractor shall take all necessary precautions, as outlined herein, to protect the existing trees to be preserved from injury or death. Protection shall be given to the roots, trunk, and foliage of all existing trees to remain.

D. Trees, subject to the provisions of this Section, which have been injured, shall be repaired immediately by an approved, ISA certified arborist. Repair shall include removal of rough edges and sprung bark and severely injured branches as directed by the Owner's Representative.

E. Tree protection fencing shall be installed for the protection of existing trees to be preserved. No construction, demolition, or work of any nature will be allowed within the fenced area without prior written approval by the Owner's Representative.
   1. Approval by the Owner's Representative for work within the fenced area shall not release the Contractor from any of the provisions specified herein for the protection of existing trees to be preserved.
   2. During the course of construction of approved work within the fenced area, no roots larger than two (2) inches in diameter shall be cut without prior written approval by the Owner's Representative.

F. During construction the existing site surface drainage patterns shall not be altered within the area of drip line.

G. Do not permit the following within drip line of any existing tree to be preserved:
   1. Storage or parking of automobiles or other vehicles.
   2. Stockpiling of building materials or refuse of excavated materials.
   3. Skinning or bruising of bark.
   4. Use of trees as support posts, power poles, or signposts; anchorage for ropes, guy wires, or power lines; or other similar functions.
   5. Dumping of poisonous materials on or around trees and roots. Such materials include but are not limited to paint, petroleum products, dirty water, or other deleterious materials.
   6. Cutting of tree roots by utility trenching, foundation digging, placement of curbs and trenches, and other miscellaneous excavation without prior written approval by the Owner's Representative.
   7. Damage to trunk, limbs, or foliage caused by maneuvering vehicles or stacking material or equipment too close to the tree.

8. Compaction of the root area by movement of trucks or grading machines; storage of equipment, gravel, earth fill, or construction supplies; etc.
9. Excessive water or heat from equipment, utility line construction, or burning of trash under or near shrubs or trees.
10. Damage to root system from flooding, erosion, and excessive wetting and drying resulting from dewatering and other operations.

3.2 TREE REMOVAL

A. Trees designated for removal shall be removed to a point at least one (1) foot below the lowest level of sub-grade upon which fill will be placed.

B. Soil within a radius of ten (10) feet of the removed tree under paved area shall receive soil sterilization before further preparation of the sub-grade.

3.3 TRIMMING OF TREES

A. In company with the Owner's Representative and an ISA certified arborist, ascertain the limbs and roots which are to be trimmed, and clearly mark them to designate the approved point of cutting.

B. A consulting arborist, certified by the International Society of Arboriculture (ISA), shall be engaged to direct removal of branches from trees and large shrubs which are to remain if required to clear for new construction.

C. Dead and damaged trees that are determined by the Owner's Representative and arborist to be incapable of restoration to normal growth pattern shall be removed.

D. Cut evenly, using proper tools and skilled workmen, to achieve neat severance with the least possible damage to the tree.

E. In the case of root cuts, apply wet burlap or other protection, approved as noted herein, to prevent drying out, and maintain in a wet condition as long as necessary for temporary protection.

3.4 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within drip line of trees unless otherwise indicated. Any grade change shall be limited to six (6) inches of cut or fill from the original grade and shall be accomplished by hand.

B. Lowering Grades: where existing grade is above new finish grade shown around trees, carefully hand excavate within drip line to new grade. Cut roots exposed by excavation to approximately three (3) inches below elevation of new finish grade.

C. Raising Grades: permitted only as acceptable to Owner's Representative.

D. If building pads or foundations are to be constructed within the fenced areas or if the existing landscape is to be altered by the addition of fill or reduced by excavation, the Owner's Representative shall be notified prior to this work. Measures as approved by the Owner's Representative, such as small retaining walls or sub-grade aeration lines.

3.5 REPAIR COMPENSATION

A. Damage to existing tree crowns or roots over one (1) inch in diameter shall be immediately reported to Owner's Representative in writing, and at the direction of the Owner's Representative, repaired immediately at the Contractor's expense by an approved, ISA certified arborist.

B. An ISA certified arborist shall direct repair of trees damaged by construction operations. Repairs shall be made promptly after damage occurs to prevent progressive deterioration of damaged trees. Repairs or replacement, if directed, shall be at Contractor's expense.

C. Damaged tree limbs or trees which have died as a result of injury during construction shall remain the property of the Owner and shall remain or be removed by the Contractor as directed by the Owner's Representative.

3.6 MAINTENANCE

A. Contractor shall be responsible to perform regular inspections of existing trees to be preserved and submit written proposals to the Owner's Representative for additional maintenance work as may be required to ensure the health and general well-being of the trees. Contractor shall retain, at the direction of the Owner's Representative additional specialists as may be required to perform this work.

B. Provide type-written monthly Maintenance reports for review by Owner's Representative.
1. Identify each tree, by genus, species and the number indicated on the Drawings.
2. Relate days on which fertilizing, mulching, pruning and spraying occurred.
3. Relate days on which watering occurred, including times and duration of watering.
4. Report on each tree's general health and condition.

C. The maintenance of the trees shall comply with standard horticultural practice for the correct watering, fertilizing, pruning and spraying of specimen boxed trees.
1. Fertilizing: All trees are to be fertilized before, during, and after construction by pumping under pressure directly 18 inches into the root zone as directed by the Consulting Arborist.
2. Root Hormone: The following shall apply to each tree:
   a. Tree basins shall be constructed at rims or outer edge of the tree root ball so that applied water will remain on top of the root ball.
   b. Root hormone shall be applied at the rate of two (2) ounces of root hormone dissolved in a two (2) gallon bucket of water, poured on top of the root ball and contained thereon by the basin rims. Immediately after root hormone application, the tree basin shall be filled with water and allowed to settle within the soil.

      The application shall be repeated. The tree basin shall be filled with water and allowed to settle within the soil. The application of water shall be repeated twice.

3. Vertical mulch pockets filled with pea gravel, course sand and root hormone shall be installed at no additional cost to the Owner if soil or environmental conditions detract from tree basin root ball feeding. Do not damage tree roots.

a. Vertical mulch pockets, 18-inches to 2-inches deep and two (2) inches in diameter, spaced around root ball of tree. Verify effectiveness of root feeding and watering and advise Owner's Representative of any feeding inadequacies.

D. The Contractor shall keep the tree preservation area free from weeds and debris at all times.

E. Irrigation: During construction the existing trees to be preserved shall, at the direction of the Owner's Representative, be given deep watering (be irrigated). Quantities and lengths of time are variable and shall depend upon seasonal rainfall.

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

1.2 Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. As specified in Section 01 25 00 "Substitution Procedures."

C. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics for the purpose of evaluation.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

D. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

E. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
3. Architects's Action: If necessary, Architect will request additional information or documentation for evaluation withion one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 working days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
    a. Form of Approval: As specified in Section 01 33 00 Submittal Procedures.
    b. Use product specified if Architect does not issue a decision on use of a comparable product request within the time allocated.

F. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 33 00 "Submittal Procedures."

G. Substitution: Refer to Section 01 25 00 "Substitution Procedures" for definition and limitations on substitutions.

1.3 GENERAL REQUIREMENTS

A. If the Contract Documents are not in concurrence regarding the quantity or quality of products, submit a Request For Information (RFI) to the Architect as specified in Section 01 31 00 "Project Management and Coordination."

B. If the Contractor fails to make such a request, it is presumed that the most expensive has been accommodated in the Bid.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Resolution of Compatibility Disputes between Multiple Contractors:

    a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
    b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

B. Asbestos Content: All products furnished and/or installed for this Project must be 100 percent free of asbestos containing materials.

C. Electrical Products and Materials: All electrical products and materials furnished and/or installed for this Project must bear the Underwriter's Laboratories (U.L.), or other accepted agencies listing label. Any Project-related modification to these products must be in compliance with the National Electrical Code requirements and listed by U.L.

D. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

1. Coordinate deliveries to the site with the Owner, Architect so as to allow for inspection by these parties prior to incorporation in the Work.
2. Any materials which the Owner, Architect determines cannot be received on site will be stored off-site in a secure location, at no additional cost to the Contract, until they can be received at the site. Contractor/Subcontractor must insure off-site storage against damage or loss and provide record of material insurance to the Owner.
3. Provide signed material receipts to the Owner upon request.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Contractor is responsible for designating and allotting on-site storage space. Any relocation of stored materials necessitated by Work progress will be accomplished promptly without additional cost to the Contract.
2. Provide a secure location and enclosure at Project site for storage of materials and equipment.
3. Store products to allow for inspection and measurement of quantity or counting of units.

4. Store materials in a manner that will not endanger Project structure.
5. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
6. Store cementitious products and materials on elevated platforms.
7. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
9. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 WARRANTY

A. Materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit.

1. Work, materials, or equipment not conforming to these requirements may be considered defective.

B. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.

1.8 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
7. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.

B. Product Selection Procedures:

1. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

a. For approval of products by unnamed manufacturers, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions.

C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.

2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE OR EQUIVALENT PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. Provide information below on the Comparable Product Request Form. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

B. Submittal Requirements: Incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Architect of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 71 23 – FIELD ENGINEERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for establishment of control points, elevations and reference grids to control elevations and dimensions for accurate location of the Work.

1.2 SUBMITTALS

A. Submittals:
   1. Survey Notes: Submit to Architect prior to finalizing survey.

B. Record Property Survey: As required for Record Documents, show significant features (real property) that have resulted from construction of the project. Provide certification, signed by the Surveyor, that principal lines and levels of the project are accurately positioned as shown on the survey.
   1. Submit digital file on media and in format conforming to Project requirements.

1.3 QUALITY ASSURANCE

A. Qualifications: Land Surveyor or Professional Engineer experienced and specializing in land survey work and registered in the State of California to perform Work of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stakes: Stakes shall have the following minimum nominal dimensions. Hubs shall be 2 by 2 by 8 inches. Grade, reference, slope, and other stakes shall be 1 by 2 by 18 inches. Lath shall be 3/8" x 2" x 4" feet. Other dimensions and materials may be used, such as steel reinforcing bars and metal pins. The top two inches of all slope, grade, reference, clearing and structure stakes shall be painted and marked with plastic flagging.

B. Marking Stakes: All stakes shall be legibly marked with a stake pencil that leaves an imprint.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify information shown on drawings against Owner provided data, record documents of prior construction, property survey and existing benchmarks prior to laying out the Work. Locate benchmarks and establish a minimum of three permanent control points; record locations with vertical and horizontal data.

B. Deviations between the horizontal or vertical alignment data shown on the Drawings and the alignment observed on the ground shall be referred to the Architect. Fixing of these areas with approved markers shall be deferred until these differences are reconciled.

C. Location of Existing Utilities and Improvements: Verify locations in field. Location indicated on drawings is approximate and may differ from actual location.

D. The Contractor must comply with all applicable State of California, AHJ and Utility service provider notification requirements for line locations prior to start of the Work. When interruption of utility service is required for the Work, the Contractor shall be responsible for temporary services and protection of work to remain.
   1. Notify the utility and the Architect upon discovery of uncharted utilities and provide complete information of service type, ownership, and location.
   2. The Contractor shall be responsible for all losses and expense incurred due to utility damage and unscheduled interruption resulting from the Work.

3.2 PERFORMANCE

A. Working from the lines and levels documented by the Owner’s property survey, establish and maintain benchmarks and points to set locations, lines and levels for the Work as needed to properly place each element of the Project. Calculate and measure required dimensions as shown within recognized tolerances. Do not scale dimensions from drawings. Advise lower tier contractors of Project locations, lines and levels established for their use.
   1. Record locations and elevations of adjoining structures, pavements, and improvements, monitor for settlement, displacement and other conditions that might be construed as damage incidental to Work.

B. Before proceeding with the layout of actual work, verify the layout information shown on the drawings in relation to the property survey and existing benchmarks. As work proceeds, check every major element for line, level and plumb. Maintain a surveyor's log or record book of such checks; make this log or record book available for the Architect's reference. Record deviations from required lines and levels and advise promptly upon detection of deviations that exceed indicated or recognized tolerances. Record accepted deviations on record drawings. Locate, lay-out, and maintain the following until construction is complete and accepted:
   1. Site Improvements: Pavements, grading stakes, utility slopes, and invert locations.
   2. Building Lines and Levels: Batter boards, column grids, floor levels, and control points for mechanical and electrical Work.
   3. Existing Utilities: Control points for relocation.

C. Do not begin construction work until stakes, marks, and controls established by the Contractor for that particular construction item are approved in writing by the Architect. Approval of the construction staking work shall not relieve the Contractor of responsibility for maintaining survey work and correcting errors, whether the errors are discovered during the actual survey work or in subsequent phases of the project.

D. Before substantial completion, prepare a Record Project survey showing significant features (real property) that have resulted from construction of the project. Include on the survey a certification, signed by the Surveyor, to the effect that principal lines and levels of the project are accurately positioned as shown on the survey.

E. Tolerances: Maintain a neat, well-organized log of survey work. Record deviations from required lines and levels, notify Architect when deviations exceed typical and specified tolerances. Conform to tolerances specified in individual Sections and the following:
   1. Cut and Fill Depths: Within 0.5 ft. for consecutive locations.
   2. Finished Grades: 0.1 ft.

END OF SECTION

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering.
3. Installation.
4. Uncovering and Correction of the Work.
5. Coordination of Owner's portion of the Work.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

1.2 OWNER'S SURVEY

A. Property Survey: Provided by the Owner describing the physical characteristics, legal limitations, and utility locations for the site of the Project, and a legal description of the site.

1. The Contractor will be entitled to rely on the accuracy of information furnished by the Owner but will exercise proper precautions relating to the safe performance of the Work.

1.3 CONTRACTOR EXAMINATION OF EXISTING CONDITIONS

A. The Contract Documents are complementary. Before starting each portion of the Work, study and compare the Contract Documents relative to that portion of the Work, as well as information furnished by the Owner. Take field measurements of existing conditions related to that portion of the Work and observe conditions at the site affecting it.

B. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a Request For Information per Section 01 31 00 "Project Management and Coordination."

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certified Surveys: Submit two copies signed by land surveyor or professional engineer.

C. Certificates: Submit certificate signed by land surveyor or professional engineer, certifying that location and elevation of improvements comply with requirements.

D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 CLOSEOUT SUBMITTALS

A. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.6 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Professional Engineer Qualifications: Refer to Section 01 40 00 "Quality Requirements."

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where

indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.

B. Engage a land surveyor or professional engineer experienced in laying out the Work, using the following accepted surveying practices:

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

D. Final Property Survey: Engage a land surveyor or professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces, unless otherwise indicated on Drawings.
5. Install materials, products, and equipment such that manufacturer's labels do not appear on exposed surfaces of the finished work, except in unfinished portions of the building such as mechanical equipment rooms.
6. Install materials, products, and equipment so they are readily accessible for operation, maintenance, and repair. Minor deviations from Drawings may be made to accomplish required accessibility, but changes involving extra cost shall not be made without prior written approval.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 UNCOVERING OF THE WORK

A. Prematurely Covered Work: Uncover the portion of the Work prematurely covered contrary to the Contract Documents, as requested in writing by the Architect, for the Architect's examination.

1. Replace work without a change in the Contract Time or sum.

B. Architect's Request to Uncover Work: Uncover the portion of the Work as requested in writing by the Architect.

1. Work in accordance with the Contract Documents: Submit a change order as an adjustment to the Contract Sum and Contract Time.
2. Work not in accordance with the Contract Documents: Submit a change order as a credit to the Owner for an adjustment of the Contract Sum. Adjustments for Contract Time will not be permitted.

3.7 COORDINATION OF OWNER'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for Owner's construction personnel and Owner's separate contractors.
1. Refer to Section 01 11 00 "Summary" for other requirements for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel and Owner's separate contractors.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel and Owner's separate contractors at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

C. Owner-Furnished Owner-Installed (OFOI) Products: As specified in Section 01 11 000 "Summary."

1. Provide mechanical and electrical service lines and support systems for such products, where indicated. Final connections from service lines to the equipment will be provided by the Owner, unless otherwise indicated.

3.8 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.

a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces in accordance with written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal:

1. Do not bury or burn waste materials on-site.
2. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.10 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

D. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

A. Before Substantial Completion: Promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents.

1. Costs of correcting, including but not limited to, additional testing and inspections, uncovering and replacement, and compensation for the Architect's services will be at the Contractor's expense.
2. After Substantial Completion: Correct promptly any of the Work found to be not in accordance with the requirements of the Contract Documents.

    a. Notification: The Owner will notify the Contractor promptly after discovery of the condition to be corrected.

        1) During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty.
        2) If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it.

3. Period for correction of Work: Extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

    a. The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor.
    b. Compliance with the Contract Documents are not encumbered by the period for correction of Work.

B. Work by Others: The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

C. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.

1. Comply with requirements in Section 01 73 29 "Cutting and Patching."
2. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

D. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

E. Restore permanent facilities used during construction to their specified condition.

F. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

G. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

H. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

I. Acceptance of Nonconforming Work: If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be affected whether or not final payment has been made.

END OF SECTION 01 73 00

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Contractor is responsible for cutting, fitting, and patching required for alteration Work or to correct or modify newly installed construction, including but not limited to:

1. Coordination between trades.
2. Performing sequential excavation and backfill.
3. Completing the Work or making its several parts fit together properly or integrate with other Work.
4. Uncovering portions of the Work to provide for installation of ill-timed Work.
5. Removing and replacing defective Work.
6. Removing and replacing Work not conforming to requirements of Contract Documents.
7. Removing samples of installed Work as specified for testing.
8. Providing routine penetrations of non-structural surfaces for installation of materials such as piping and electrical conduit.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 PREINSTALLATION MEETINGS

A. Cutting and Patching Conference: Conduct conference at Project site.

1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:

a. Contractor's superintendent.
b. Trade supervisor responsible for cutting operations.
c. Trade supervisor(s) responsible for patching of each type of substrate.
d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.

2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 QUALITY ASSURANCE

A. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch

structural elements in a manner that could change their load-carrying capacity or increase deflection.

1. A structural element includes any load-bearing, lateral force-resistant member, and wind or seismic movement resisting construction.
2. Take precautions and exercise care to ensure Work is removed neatly and without movement or settlement to remainder of building. Contractor will be held liable for any damage, movement, settlement caused thereby or resulting therefrom.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

C. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

F. Qualifications: Workers to have minimum three (3) years of experience in working with materials being cut and patched.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials.

1. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
2. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

C. Materials used for sealing openings shall have a fire rating equal to or greater than the rating of the floor, ceiling or partition and shall comply with applicable codes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
2. Restore Work and surfaces with new products in accordance with requirements of the Contract Documents.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. Employ original Installer for cutting and patching of newly installed construction; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Refinish entire surfaces as necessary to provide an even new finish.
    b. For continuous surfaces, refinish to nearest intersection.
    c. For assemblies, entirely refinish.
    d. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    e. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Patch subfloors under removed partitions, fixed equipment, etc. by cutting back, applying underlayment, concrete fill, or other acceptable leveling fill as necessary to provide subfloor that is level with adjacent existing subfloors and properly prepare to receive finish flooring.
    b. In renovated rooms/areas to receive new floor finishes, remove existing finish flooring and related materials and prepare subfloor by cutting back, applying concrete fill or other acceptable leveling fill as necessary to provide subfloor that is level and properly prepared to receive new floor finish as required by Room Finish Schedule and material manufacturers written recommendations.
    c. In renovated rooms/areas to receive new wall finishes, those portions of existing walls that remain shall have their surfaces patched, cut back, or brought forward as necessary, and prepared as required to receive the new finishes per Room Finish Schedule.
    d. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for the substrate over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
    e. In rooms or areas where patching is required on one wall only, that entire wall is to be refinished to match the existing finish and color, including existing painted doors, door frames and window frames if they occur in that wall.
    f. In rooms or areas where patching is required on two or more walls, all walls, including painted doors, door frames and painted window frames, are to be refinished.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

a. In rooms or areas where patching is required in an existing plaster or gypsum wallboard ceiling, the entire ceiling is to be repainted. In rooms where patching is required in existing acoustic tile ceilings, patch ceilings with matching type and pattern of acoustic tile, clean all remaining tile and apply one coat of white latex paint by roller over all tile surfaces. Clean all exposed metal suspension system.

5. Fire-Resistive Materials: Patch and repair to restore fire protection to original condition.
6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
7. Openings created as a result of removal of materials must be patched to match adjacent construction as to materials and finishes, unless otherwise indicated.

   a. Provide lintels where openings are cut through existing masonry or concrete walls. Refer to Lintel Schedule as indicated on the Drawings.

8. Close up the unused portion of the opening with materials matching adjacent construction where existing equipment is removed and new equipment is installed in the existing opening.
9. When new rubber or vinyl stair treads, risers, and landings, are installed at existing stairs, paint all exposed steel.
10. Paint all exposed insulated or non-insulated pipes and ducts in finished rooms or areas.
11. Patch and repair the floor, walls, and ceiling where existing equipment or assemblies are removed.

D. Roofing:

1. Before commencing with cutting and patching of roofing, consult with the Owner regarding the existence of an outstanding roofing warranty. If such a warranty exists, obtain written approval of the methods to be used from the roofing manufacturer who issued the warranty so as not to affect the value of the warranty.
2. If necessary, cutting and patching of roofing to be performed by roofing manufacturer authorized personnel only.
3. Cut, patch, repair and extend roofing and insulation as follows:

   a. Where disturbed or damaged by alteration Work or activities related to same.
   b. Where new Work connects to existing construction.

4. Protect roof areas penetrated for alterations against damage and leaks. Do not leave roof openings uncovered or unprotected overnight or during any periods of rainy or inclement weather.
5. Remove loose aggregate, if applicable, and store away from work area.
6. Work shall be performed in a manner to provide for permanent water-tight splice or repair.
7. Roof repair and alteration Work and materials shall match existing roofing materials and construction.
8. Upon completion and inspection of splice or repair Work, remove debris from the roof and replace the aggregate as required.
9. Protect undisturbed existing and newly repaired roofing subject to traffic and damage.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed.

B. Completely remove paint, mortar, oils, putty, and similar materials from any surface not intended to receive these materials.

END OF SECTION

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Construction Waste Management Plan.
      a. Construction Waste Management requirements based upon Local Agency regulations and Owner’s recycling targets.
   2. Recycling nonhazardous demolition and construction waste.
   3. Disposing of nonhazardous demolition and construction waste.

B. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, State, and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Stnadrards Code, “CAL-Green.”

B. Local Agency Construction and Demolition Waste Recyling Ordinances, as applicable.

1.3 PROJECT CONDITIONS

A. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with all CAL-Green and Local Agency Construction and Demolition Debris Waster Reduction and Recycling requirements.

B. Comply fully with Federal and local environmental and anti-pollution regulations.
   1. Do not dispose of volatile waste, oil or solvents in storm or sanitary drains.
   2. Burning or burial of debris, rubbish, or other waste material in the premises is not permitted.

1.4 DEFINITIONS

A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

G. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

H. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

I. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.5 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste become property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.6 ACTION SUBMITTALS

A. Waste Management Plan: Prepare and submit plan within 7 days of date established for the Notice of Award.

1.7 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Agency required forms. Include the following information:

1. Material category.
2. Generation points of waste.
3. Total quantity of waste in tons.
4. Quantity of waste salvaged, both estimated and actual in tons.
5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green” 5.408.2, and all applicable local codes and ordinances to the satisfaction of the enforcing agency.

1. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
2. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

D. Submit certification from any recycling services that are not listed in the Local Agency Waste Management Authority's Builder's Guide.

E. Submit with all Pay Applications, certification letter, waste management lob and receipts from all recycled and waste off-haul. Certification letter to state that under the penalty of perjury all materials removed from site during the building period are included within the attached receipts and provide summary. Project inspector to verify all loads prior to off-haul and initial receipts prior to submitting with pay application.

1.8 PERFORMANCE REQUIREMENTS

A. General: Recycle or salvage for reuse a minimum of 65% of non-hazardous construction and demolition debris, or meet a location construction waste ordinance, whichever is more stringent.
   1. Calculate the amount of meterials diverted by weight or by volume, but not both.
   2. Exceptions: Excavated soil andland clearing debris, as specified below.

B. Excavated Soil and Land Clearning Debris: Recycle or salvage for reuse 100 percent of trees, stumps. Rocks and associated vegetation and soils resulting primarily from land cleaning activities.

C. Practice efficient waste management in the use of materials in the course of Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvaging of materials.

1.9 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.

D. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
   1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
   2. Review requirements for documenting quantities of each type of waste and its disposition.

3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.10 WASTE MANAGEMENT PLAN

A. General: Develop and implement a Waste Management Plan that complies with applicable Local Agency Construction and Demolition (C&D) Waste Recycling ordinance, and with California Code of Regulations, Title 24, Part11 California Green Building Standards Code, “CAL-Green” 5.408.
1. Identifies materials to be diverted from disposal by efficient usage, recycling, reuse on the Project, or salvage for future use, or sale.
2. Determines if materials will be sorted on-site or mixed.
3. Identifies diversion facilities where material collected will be taken.
4. Specifies that quantities of diverted material will be calculated by weight or volume, but not both.

PART 2 - PRODUCTS

2.1 FIRE PROTECTION

A. Store volatile waste in covered metal containers.

B. Remove volatile waste from premises daily.

2.2 CLEANING MATERIALS

A. Cleaning Agents: Use cleaning materials and agent recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning materials only on surfaces recommended by cleaning material manufacturer or by the manufacturer of the surface to be cleaned.

B. Use cleaning products that comply with Green Seal’s GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

2.3 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 65 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:

a. Asphalt paving.
b. Concrete.
c. Concrete reinforcing steel.

d. Brick.
e. Concrete masonry units.
f. Wood studs.
g. Wood joists.
h. Plywood and oriented strand board.
i. Wood paneling.
j. Wood trim.
k. Structural and miscellaneous steel.
l. Rough hardware.
m. Roofing.
n. Insulation.
o. Doors and frames.
p. Door hardware.
q. Windows.
r. Glazing.
s. Metal studs.
t. Gypsum board.
u. Acoustical tile and panels.
v. Carpet.
w. Carpet pad.
x. Demountable partitions.
y. Equipment.
z. Cabinets.
aa. Plumbing fixtures.
bb. Piping.
cc. Supports and hangers.
dd. Valves.
ee. Sprinklers.
ff. Mechanical equipment.
gg. Refrigerants.
hh. Electrical conduit.
ii. Copper wiring.
jj. Lighting fixtures.
kk. Lamps.
ll. Ballasts.
mm. Electrical devices.
nn. Switchgear and panelboards.
oo. Transformers.

2. Construction Waste:

a. Masonry and CMU.
b. Lumber.
c. Wood sheet materials.
d. Wood trim.
e. Metals.
f. Roofing.
g. Insulation.
h. Carpet and pad.
i. Gypsum board.
j. Piping.
k. Electrical conduit.
l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

1) Paper.
2) Cardboard.
3) Boxes.
4) Plastic sheet and film.
5) Polystyrene packaging.
6) Wood crates.
7) Wood pallets.
8) Plastic pails.

m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:

1) Paper.
2) Aluminum cans.
3) Glass containers.

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

D. Waste Management in Historic Zones or Areas: Transportation equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, by 12 inches (300 mm) or more.

3.2 SALVAGING DEMOLITION WASTE

A. Comply with requirements in Section 02 41 16 Demolition for salvaging demolition waste.

B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

C. Salvaged Items for Sale and Donation: Not permitted on Project site.

D. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

F. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

G. Plumbing Fixtures: Separate by type and size.

H. Lighting Fixtures: Separate lamps by type and protect from breakage.

I. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.4 RECYCLING DEMOLITION WASTE

A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch (38-mm) size.

1. Crush asphaltic concrete paving and screen to comply with requirements in Section 31 23 13 "Earth Moving" for use as general fill.

B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
1. Crush concrete and screen to comply with requirements in Section 31 23 13 "Earth Moving" for use as satisfactory soil for fill or subbase.

D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.

1. Clean and stack undamaged, whole masonry units on wood pallets.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

G. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

H. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

I. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.

J. Carpet : Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.

1. Store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

K. Carpet Tile: Remove debris, trash, and adhesive.

1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

L. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.

M. Conduit: Reduce conduit to straight lengths and store by material and size.

N. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction comply with applicable Local Agency Construction and Demolition (C&D) Waste Recycling ordinance, and with California Code of Regulations, Title 24, Part11 California Green Building Standards Code, “CAL-Green” 5.408.

B. Comply with City of Los Angeles Citywide Construction and Demolition (C&D) Waste Recycling Ordinance.
   1. All mixed C&D waste generated within City limits is required to be taken to City-certified C&D waste processors.
   2. All Haulers responsible for handling C&D waste must obtain a Private Solid Waste Hauler Permit from City of Los Angeles Bureau of Sanitation prior to collecting, hauling and transporting C&D waste.

C. Recycling Receivers and Processors:
   1. Obtain forms necessary to apply for a Waste Haulter Permit, or a list of City Permitted Waste Haulers, or a current list of City Certified Processing Facilities from the City of Los Angeles Bureau of Sanitation.
      a. C&D Recycling Coordinator (212)485-2260.
         www.lacitysan.or/solid_Resources/recycling.c&d.htm.

D. Burning: Do not burn waste materials.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. List of incomplete items.
4. Submittal of Project warranties.
5. Final cleaning.
6. Repair of the Work.

1.2 DEFINITIONS

A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

B. Substantial Completion: The stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use and when only minor items can be corrected or completed without any material interference with the Owner's use of the work remaining to be corrected or completed.

1. When the Contractor considers that the Work, or a portion which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest-control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. Include with the request the following:

1. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
2. Submittals Prior to Substantial Completion: Complete the following a minimum of days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

a. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
b. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
c. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
d. Deliver certificates of inspection confirming compliance with applicable codes and regulations for the following:

1) Elevators.
2) Plumbing and drainage.
3) Heating, ventilating and air conditioning.
4) Fire protection.
5) Electrical.

e. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.

1) Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

f. Submit testing, adjusting, and balancing records.
g. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

B. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

C. Inspection: On receipt of written request for inspection, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor listed by room or space number.
2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.
4. Submit list of incomplete items in the following format:
    a. MS Excel Electronic File: Architect will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
    1. Submit on digital media acceptable to Architect.

E. Warranties in Paper Form:
    1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
    2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
    3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations' maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
g. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
h. Vacuum and mop concrete.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

p. Replace parts subject to unusual working conditions.

q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

r. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.

s. Replace burned out bulbs, and those noticeably dimmed by hours of use. Comply with requirements for new fixtures.

t. Clean strainers.

u. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

E. Construction Waste Disposal: Comply with waste-disposal requirements in Section 01 74 19 Construction Waste Management and Disposal.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 01 73 00 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Emergency manuals.
3. Systems and equipment operation manuals.
4. Systems and equipment maintenance manuals.
5. Product maintenance manuals.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Manual Content Submittal: Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:

1. Submit on digital media acceptable to Architect. Enable reviewer comments on draft submittals.
2. Submit three paper copies. Architect will return two copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 COORDINATION

A. Where operation and maintenance documentation include information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf or post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.

3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:

1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.

6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name, and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name, and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Job Set Drawings.
2. As-Constructed Record Drawings.
3. As-Constructed Record Digital Data Files.
4. Record Job Specifications.
5. As-Constructed Record Specifications.
6. Record Product Data.
7. Miscellaneous Record Submittals.

1.2 DEFINITIONS

A. As-Designed Record Document: Record document which may include revisions to issued contract documents, reflecting significant changes in the Work made during construction.

B. As-Constructed Record Document: Record document which may include revisions to issued contract documents, reflecting significant changes in the Work made during construction, which are based on data furnished by the contractor or other parties, engineers, or their consultants.

1.3 CLOSEOUT SUBMITTALS

A. Record Job Set Drawings:

1. Submit scanned PDF electronic file(s) of marked-up paper copy.
2. Submit one set(s) of prints.

B. As-Constructed Record Drawings: Comply with the following:

1. Initial Submittal:

a. Submit Annotated PDF electronic file.
b. Architect will indicate whether general scope of documentation, additional information required, and quality of documentation are acceptable.

2. Final Submittal:

a. Submit Annotated PDF electronic file and set(s) of plots.
b. Plot each drawing file, whether or not changes and additional information were recorded.

C. As-Constructed Record Digital Data Files: In coordination with As-Constructed Record Drawings provide files as outlined corresponding with PDF sheets. Submit in the following formats:

1. Native model authoring software.

2. buildingSMART IFC.

D. Record Job Specifications:

1. Submit annotated PDF electronic files.
2. Submit one printed set(s).

E. As-Constructed Record Specifications:

1. Submit annotated PDF electronic files.
2. Submit one printed set(s).

F. Record Product Data:

1. Submit annotated PDF electronic files.
2. Submit one printed set(s).
3. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

G. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities.

1. Submit annotated PDF electronic files.
2. Submit one printed set(s).

H. Reports: Submit written report weekly indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

A. Record Job Set Drawings: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.

g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
7. Organize record prints into manageable sets.

a. Prints: Bind each set with durable paper cover sheets. Include identification on cover sheets.
b. Scanned PDF: Bookmarked by discipline and sheet, compiled to align with originally issued documents.

B. As-Constructed Record Drawings: Identify and date each As-Constructed Record Drawing; include the designation "AS- CONSTRUCTED PROJECT RECORD DRAWING" in a prominent location.

1. Architect will furnish Contractor via Owner digital data files of the As-Designed Record Documents for use in preparation of the As-Constructed Record Drawings.

a. See Section 01 31 00 "Project Management and Coordination" for requirements related to use of Architect's digital data files.

C. As-Constructed Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Architect for resolution.
3. Architect will furnish Contractor via Owner digital data files of the As-Designed Record Documents for use in preparation of the As-Constructed Digital Data Files.

a. See Section 01 31 00 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
b. Architect will provide data file layer information. Record markups in separate layers.
c. Record three-dimensional model with elements developed to LOD 500.

4. Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
5. Identification:

a. Project name.
b. Date.

c. Designation "AS-CONSTRUCTED PROJECT RECORD DRAWING."
d. Name of Architect.
e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

A. Record Job Specifications: Maintain one set of marked-up paper copies of the Project Manual, incorporating new and revised specifications as modifications are issued.

1. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.

a. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
b. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
c. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
d. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
e. Note related Change Orders and Record Drawings where applicable.

B. As-Constructed Record Specifications: Identify and date each Specification; include the designation "AS-CONSTRUCTED PROJECT RECORD SPECIFICATION" in a prominent location.

1.6 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
4. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of and instruction in the operation and maintenance of systems, subsystems, and equipment.

1.2 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For facilitator, instructor, videographer.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.
d. Name of Construction Manager.
e. Name of Contractor.
f. Date of video recording.

2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.

4. At completion of training, submit complete training manual(s) for Owner's use prepared in same PDF electronic file format on portable storage device required for operation and maintenance manuals specified in Section 01 78 23 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
1. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
2. Review required content of instruction.
3. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master.

For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Regulatory requirements.
    e. Equipment function.
    f. Operating characteristics.
    g. Limiting conditions.
    h. Performance curves.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Systems and equipment operation manuals.
    c. Systems and equipment maintenance manuals.
    d. Product maintenance manuals.
    e. Project Record Documents.
    f. Identification systems.
    g. Warranties and bonds.
    h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

    a. Instructions on meaning of warnings, trouble indications, and error messages.
    b. Instructions on stopping.
    c. Shutdown instructions for each type of emergency.
    d. Operating instructions for conditions outside of normal operating limits.
    e. Sequences for electric or electronic systems.
    f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Regulation and control procedures.
    e. Control sequences.
    f. Safety procedures.
    g. Instructions on stopping.
    h. Normal shutdown instructions.
    i. Operating procedures for emergencies.
    j. Operating procedures for system, subsystem, or equipment failure.
    k. Seasonal and weekend operating instructions.
    l. Required sequences for electric or electronic systems.
    m. Special operating instructions and procedures.

5. Adjustments: Include the following:

    a. Alignments.
    b. Checking adjustments.
    c. Noise and vibration adjustments.
    d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
    a. Diagnostic instructions.
    b. Test and inspection procedures.
7. Maintenance: Include the following:
    a. Inspection procedures.
    b. Types of cleaning agents to be used and methods of cleaning.
    c. List of cleaning agents and methods of cleaning detrimental to product.
    d. Procedures for routine cleaning.
    e. Procedures for preventive maintenance.
    f. Procedures for routine maintenance.
    g. Instruction on use of special tools.
8. Repairs: Include the following:
    a. Diagnosis instructions.
    b. Repair instructions.
    c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    d. Instructions for identifying parts and components.
    e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
    1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
    2. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
    1. Schedule training with Owner with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

F. Cleanup: Collect used and leftover educational materials and. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode.

1. Submit video recordings on thumb drive or electronic media storage acceptable to owner.
2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents:

a. Name of Contractor/Installer.
b. Business address.
c. Business phone number.
d. Point of contact.
e. Email address.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

1. Film training session(s) in segments not to exceed 15 minutes.

a. Produce segments to present a single significant piece of equipment per segment.
b. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

1. Furnish additional portable lighting as required.

E. Narration: Describe scenes on video recording by audio narration by microphone while or by dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.

F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.

G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION

SECTION 01 81 13.71 - SUSTAINABLE DESIGN REQUIREMENTS - CALGREEN NON-RESIDENTIAL MANDATORY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: General requirements and procedures for compliance with and certification from 24 CCR 11 (hereafter, "CALGreen").

1. Some CALGreen requirements depend on product selections and may not be specifically identified as CALGreen requirements. Compliance with CALGreen requirements may be used as one criterion to evaluate substitution requests and comparable product requests.
2. Copies of CALGreen project checklists are attached at the end of this Section for information only. The checklists are for Mandatory Measures, with additional available for the voluntary CALGreen Tier 1 and Tier 2 levels of certification.

    a. Some CALGreen requirements depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site. Review CALGreen requirements and action plans for compliance with requirements. Also, reference Section 01 31 00 "Project Management and Coordination" for further information.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submit documentation to enforcing agency for credits that are the responsibility of Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until enforcing agency has made its determination on Project's CALGreen certification application.

1. Document correspondence with review team, as assigned by the enforcing agency, as informational submittals.

B. Environmental Management System: Document the following:

1. Environmental policy.
2. Regulatory compliance and training.
3. Environmental risk assessment that shows sensitive environmental areas and ranks potential risks that may arise from the construction.
4. Environmental risk management strategies.
5. Environmental management roles, responsibilities, and reporting structure for the construction phase.
6. Site and work instructions for site personnel, outlining environmental procedures during construction.
7. Environmental inspection checklists.
8. Records of compliance.

1.4 ACTION SUBMITTALS

A. General: Submit additional sustainable design submittals required by other Specification Sections.

B. Sustainable design submittals are in addition to other submittals.

1. If submitted item is identical to that submitted to comply with other requirements, include an additional copy with other submittal as a record copy of compliance with indicated CALGreen requirements instead of separate sustainable design submittal. Mark additional copy "Sustainable Design Submittal."

C. Sustainable Design Documentation Submittals:

1. Stormwater pollution prevention plan.
2. Product data for irrigation system components, including, but not limited to, the following:

a. Sprinkler Heads: Indicate degree of head rotation and spray characteristics/pattern.
b. Controllers and sensors.

3. Product data and schedules for plumbing fixtures and fittings. Include rated capacities and WaterSense certification where applicable.
4. Product data for residential appliances, indicating that products are Energy Star rated.
5. Environmental management system documents.
6. Lighting controls.
7. Environmental product declarations.
8. Third-party certifications based on multiple-attribute standards.
9. Third-party-certified life-cycle product assessments.
10. Product data, manufacturer’s certifications, chain-of-custody certification, or other documentation acceptable to authorities having jurisdiction; for products containing composite wood, agrifiber products, or wood glues, indicate compliance with California Air Resource Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Missions from Composite Wood."
11. Construction waste management plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
12. Product data and laboratory test reports for adhesives and sealants indicating VOC content and compliance with requirements for low-emitting materials.
13. Certificates for carpet and undercarpet adhesives indicating compliance with Carpet and Rug Institute’s Green Label Plus testing program.
14. Product data and laboratory test reports for paints and coatings indicating VOC content and compliance with requirements for low-emitting materials.
15. Laboratory test reports for hard flooring, insulation, acoustical ceilings, and wall coverings, indicating compliance with requirements for low-emitting materials, as defined in "Low-Emitting Materials" Article.
16. IAQ testing report from testing and inspecting agency indicating results of IAQ testing and documentation that show compliance with IAQ testing procedures and requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide products and procedures necessary to comply with CALGreen requirements referenced in the Evaluations. Although other Sections may specify some requirements that contribute to referenced CALGreen requirements, determine additional materials and procedures necessary to comply with CALGreen requirements indicated.

2.2 LOW-EMITTING MATERIALS

A. Adhesives and Sealants:

1. For field applications inside the building, adhesives and sealants shall comply with the following VOC content limits:

a. Wood Glues: 30 g/L.
b. Metal-to-Metal Adhesives: 30 g/L.
c. Adhesives for Porous Materials (except Wood): 50 g/L.
d. Subfloor Adhesives: 50 g/L.
e. Plastic Foam Adhesives: 50 g/L.
f. Carpet Adhesives: 50 g/L.
g. Carpet Pad Adhesives: 50 g/L.
h. VCT and Asphalt Tile Adhesives: 50 g/L.
i. Cove Base Adhesives: 50 g/L.
j. Gypsum Board and Panel Adhesives: 50 g/L.
k. Rubber Floor Adhesives: 60 g/L.
l. Ceramic Tile Adhesives: 65 g/L.
m. Multipurpose Construction Adhesives: 70 g/L.
n. Fiberglass Adhesives: 80 g/L.
o. Contact Adhesive: 80 g/L.
p. Structural Glazing Adhesives: 100 g/L.
q. Wood Flooring Adhesive: 100 g/L.
r. Single-Ply Roof Membrane Adhesive: 250 g/L.
s. Special-Purpose Contact Adhesive (Contact Adhesive That Is Used to Bond Melamine Covered Board, Metal, Unsupported Vinyl, Rubber, or Wood Veneer 1/16 Inch or Less in Thickness to Any Surface): 250 g/L.
t. Plastic Cement Welding Compounds: 250 g/L.
u. ABS Welding Compounds: 325 g/L.
v. CPVC Welding Compounds: 490 g/L.
w. PVC Welding Compounds: 510 g/L.
x. Adhesive Primer for Plastic: 550 g/L.
y. Architectural Sealants: 250 g/L.
z. Nonmembrane Roof Sealants: 300 g/L.
aa. Single-Ply Roof Membrane Sealants: 450 g/L.
bb. Other Sealants: 420 g/L.

2. For field applications inside the building, adhesives and sealants must comply with the requirements of SCAQMD Rule 1168 or local code when tested in accordance with the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Carpet, cushion, and undercarpet adhesives will comply with CRI's Green Label Plus testing program.

C. Paints: For field applications inside the building, wall paints must comply with local code requirements when tested in accordance with the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Resilient Flooring: Flooring must be certified by the Resilient Floor Covering Institute and/or be compliant when tested in accordance with the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Flooring must also comply with the Collaborative for High Performance Schools (CHPS) requirements.

E. Thermal Insulation: Provide insulation complying with CALGreen Tier 1 or 2 requirements.

F. Ceiling and Wall Panels: Acoustical ceiling and wall-cladding products must comply with the VOC emissions limits defined in the CHPS criteria and be listed in the CHPS Pre-Approved Products database or have a Greenguard Certification Program.

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. CALGreen requires use of a construction waste management plan outlining how waste will be divided on the construction site, as well as how often it will be hauled to a landfill or recycling center and by whom.

B. CALGreen includes a sample plan outlining all specific requirements of the plan.

C. Comply with Section 01 74 19 "Construction Waste Management and Disposal."

D. Comply with execution requirements of related Section and applicable local codes and ordinances.

E. Comply with sustainable design of Project as represented by Drawings and Specifications.

3.2 COMMISSIONING

A. CALGreen requires commissioning of the building mechanical and electrical systems to ensure proper installation and optimized performance as the building starts to be occupied. It also requires a systematic quality assurance process that spans the entire design and construction process and includes verifying and documenting that building systems and components are planned, designed, installed, tested, operated, and maintained to meet Owner?s project requirements.

B. Comply with Section 01 91 13 "General Commissioning Requirements." [

3.3 INDOOR-AIR-QUALITY ASSESSMENT

A. Air-Quality Testing:

1. Conduct baseline IAQ testing, after substantial completion of construction and prior to occupancy, in accordance with the EPA's "Testing for Indoor Air Quality - Section 01 81 09."
2. Verify compliance with standards and limits in the EPA's "Testing for Indoor Air Quality - Section 01 81 09."

    a. Carbon monoxide maximum is 9 ppm, not to exceed outdoor levels by 2 ppm.
    b. Formaldehyde maximum is 27 ppb.
    c. Particulates maximum is 50 micrograms per cubic meter.
    d. 4-Phenylcycohexene maximum is 6.5 micrograms per cubic meter.
    e. Total VOC maximum is 300 micrograms per cubic meter.

3. For each sampling point where the maximum concentration limits are exceeded, take corrective action until air samples indicate compliance.
4. For each sampling point where airborne mold and mildew indoor species distribution varies by more than 10 percent from exterior sampling specification, identify source of mold and mildew and remediate with corrective action, then retest until compliant results are attained.
5. If noncompliant test results occur, provide a written report describing source(s) of noncompliant condition(s) and corrective action(s) implemented.

END OF SECTION 01 81 13.71

SECTION 01 91 13 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SCOPE

A. This Section includes specifications for the implementation, tracking and verification of the commissioning process.

B. Commissioning is a comprehensive and systematic process to verify that the building systems perform as designed to meet the Owner's requirements. Commissioning during the construction, acceptance, and warranty phases is intended to achieve the following specific objectives:
   1. Verify and document that equipment is installed and started per manufacturer's recommendations and to industry accepted minimum standards.
   2. Verify and document that equipment and systems receive complete operational checkout by installing contractors.
   3. Verify and document equipment and system performance.
   4. Verify the completeness of operations and maintenance materials.
   5. Confirm that the Owner's operating personnel are adequately trained on the operation and maintenance of building equipment.

C. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.

D. The purpose of this Section is to specify the responsibilities and participation in the commissioning process for the following:
   1. Division 21 - Fire Suppression.
   2. Division 22 - Plumbing.
   3. Division 23 - HVAC.
   4. Division 26 - Electrical.
   5. Division 27 - Communications.
   6. Division 28 - Electronic Safety & Security.

E. Building Enclosure Commissioning responsibilities are located in Division 01 Section "Building Enclosure Commissioning."

1.2 DEFINITIONS

A. Commissioning (Cx): The process of ensuring that systems are designed, installed, functionally tested, and performing in conformity with Owner's Project Requirements (OPR), the design intent (Basis of Design (BoD)), and that the building operator has received complete equipment and systems documentation and training.

B. Commissioning Provider (CxP): The entity identified to lead, monitor, coordinate and report on project commissioning activities.

C. Commissioning Plan: A detailed plan of the organization, schedule, allocation of resources, procedures, and documentation requirements of the commissioning process.

D. Construction Verification (CV): A quality control verification process performed by the installer as building assemblies, components, equipment, and systems are being installed which documents that the materials, installation procedures, interfaces with other trades, start-up, testing, and operation are correct, complete and in compliance with contract documents and manufacturer's recommendations and are ready for functional performance testing.

E. Functional Performance Tests (FPT): Contractor testing of installed building assemblies, components, equipment, systems, and interfaces which confirms correct performance through all operating modes and compliance with contract documents and manufacturer's recommendations.

F. Commissioning Report: A document that records the activities and results of the commissioning process.

1.3 COORDINATION

A. Commissioning Team: The members of the commissioning team consist of the Commissioning Provider (CxP), the Owner's Project Manager (OPM), the Construction Manager or General Contractor (CM or GC), the design Architect and Engineers (A/E), the Mechanical Contractor (MC), the Electrical Contractor (EC), the Testing, Adjusting, and Balancing Contractor (TAB), the Controls Contractor (CC), the Communications and Technology Contractor (CTC), the Owner's maintenance staff, and any other installing Subcontractors or suppliers of equipment.

B. Management: The GC that is awarded the project shall not include the cost of the Commissioning Provider in their price. The GC (and their Subcontractors) shall include cost for their involvement in the commissioning process as described in this Section and other related commissioning sections, including completion of construction verification checklists, demonstration of installed equipment to the commissioning team members during the functional performance testing portion of the project.

C. Scheduling: The CM/GC shall integrate all commissioning activities into the master construction schedule. A timeline determined by the commissioning agent will be dedicated for system commissioning. The MEP Contractors shall coordinate their commissioning schedule needs with CM prior to the start of construction to ensure inclusion into the overall construction schedule. The CxP will work with the OPM and CM/GC to schedule commissioning activities. All parties will address scheduling issues in a timely manner in order to expedite the commissioning process.

D. Tracking Contractor Required Testing: Each Contractor is responsible for completing various tests per their associated specifications. Each Contractor will forward a list of their associated tests to the CxP, who will generate an overall list for tracking purposes.

1.4 COMMISSIONING PROCESS

A. The following activities describe the commissioning tasks and the general order in which they occur. The CxP coordinates all activities.
   1. Scoping Meeting: All members of the design and construction team that will be involved in the commissioning process meet and agree on the scope of work, tasks, schedules, deliverables, and responsibilities for implementation of the Commissioning Plan.

2. Commissioning Plan: The Commissioning Plan developed by the CxP provides guidance in the execution of the commissioning process. The Specifications take precedence over the Commissioning Plan.
3. Submittals: Contractor submittals, including detailed start-up procedures, applicable to systems being commissioned is submitted to the CxP to be reviewed concurrent with the A/E's review. The CxP will review Contractor submittals for compliance with OPR and BoD.
4. Site Visits: Commissioning is a team effort requiring the cooperation of all parties. Contractors are to proactively carry out their commissioning responsibilities and are to assist the CxP during site visits in performing commissioning tasks. This includes providing access to and demonstrating the installation, operation and testing of commissioned systems; responding to CxP requests for information; carrying out proactive and corrective actions; and accurate reporting on system status and conditions.
5. Start-Up/Construction Verification Checklists: The CxP works with the Subcontractors to develop startup plans and documentation formats, including providing the Subcontractors with construction verification checklists to be completed prior to the acceptance testing process.
6. Functional Performance Testing: The CxP develops specific equipment and system functional performance test procedures. The Subcontractors review the procedures. The procedures are executed by the Subcontractors, under the direction of, and documented by the CxP.
7. Deficiencies and Resolution: The CxP documents items of non-compliance in materials, installation, or operation in an Issues Log. The items are corrected at the Sub's expense and the equipment or systems are retested. Each Contractor is responsible for completing action items in a timely manner that are noted in the Issues Log as their responsibility. Timely response and successful completion are a requirement to avoid withholding of payment. The CM/GC will be responsible for any cost associated with the CxP for retesting.
8. Operations and Maintenance Documentation: The CxP reviews the Operation and Maintenance documentation provided by the Subcontractors for completeness.
9. Training: The CxP reviews the training provided by the Subcontractors and verifies that it is completed.
10. Seasonal Testing: Deferred or seasonal testing is conducted, as required.
11. Warranty Review: The CxP will review status of warranty and building performance issues with the OPM, A/E, CM/GC roughly 10 months after occupancy.

1.5 RESPONSIBILITIES

A. The responsibilities of various parties in the commissioning process are provided in this Section. Note that the services for the Owner's Project Manager, Design Team, and Commissioning Provider are not included in this contract. The Contractor is not responsible for providing their services. Their responsibilities are listed here to clarify the commissioning process.

B. Commissioning Provider (CxP): The CxP is not responsible for design concept, design criteria, code compliance, general construction scheduling, cost estimating, or construction management. The CxP may assist with problem-solving deficiencies, but ultimately that responsibility resides with the General Contractor and the A/E. The primary role of the CxP is to develop and coordinate the execution of a testing plan to verify and document that systems are functioning in accordance with the design intent and the Construction Documents.
1. Construction and Acceptance Phase:

a. Coordinates and directs all commissioning activities. Work with the CM/GC and OPM to confirm that commissioning activities are scheduled.
b. Maintain an up-to-date Commissioning Plan.
c. Plan and conduct the commissioning scoping meeting.
d. Request and review additional information required to perform commissioning tasks, including Operation and Maintenance materials, Contractor start-up and checkout procedures, and sequences of operation.
e. Review Contractor submittals applicable to commissioned systems.
f. Assist Subcontractors with the development of start-up and checkout plans.
g. Write and distribute construction verification checklists to be completed by the responsible Subcontractor.
h. Perform site visits, as necessary, to observe component and system installations. Attend construction job-site meetings, as necessary, to monitor construction and commissioning progress.
i. Review completed construction verification checklist and start-up reports.
j. Assist with coordination of start-up requirements with TAB requirements.
k. Write functional performance test procedures for equipment and systems.
l. Coordinate, witness, and document functional performance tests completed by installing contractors. Coordinate retesting as necessary until satisfactory performance is verified.
m. Maintain a master deficiency and resolution record. Provide the OPM with written progress reports and test results with recommended actions.
n. Review the training proposed by the Contractors for the Owner's operating personnel.
o. Review the Operation and Maintenance manuals.
p. Prepare a final commissioning report.

2. Warranty Period:
a. Coordinate and supervise required seasonal or deferred testing and deficiency corrections.
b. Assist in the development of a preventative maintenance plan and review as-built documentation.

C. Design Team (A/E):
1. Construction and Acceptance Phase:
a. Attend commissioning scoping meeting and additional meetings, as necessary.
b. Provide design intent and sequence of operation documentation as required by the CxP.
c. Assist in resolution of system deficiencies identified during commissioning.
d. Review and approve the operations and maintenance manuals.

2. Warranty Period:

a. Assist in resolution of system deficiencies identified during warranty period commissioning.
b. Attend the end-of-warranty review walkthrough to assist in identifying issues requiring resolution and the action plan to do so.

D. Owner's Project Manager (OPM):
1. Construction and Acceptance Phase:

a. Manage the contract of the CxP.
b. Attend commissioning scoping meeting and additional meetings, as necessary.
c. Arrange for facility operating and maintenance personnel to participate in commissioning activities and training sessions.
d. Provide final approval for the completion of the commissioning work.

2. Warranty Period:

    a. Ensure that any seasonal or deferred testing and any deficiency issues are addressed.
    b. Attend the end-of-warranty review.

E. General Contractor or Construction Manager (CM or GC):
1. Construction and Acceptance Phase:
    a. Facilitate the coordination of the commissioning work by the CxP.
    b. Attend commissioning scoping meeting and additional meetings, as necessary.
    c. Furnish copies of construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CxP.
    d. Confirm that Subcontractors execute their quality assurance and commissioning responsibilities according to the Specifications and Commissioning Plan.
    e. Ensure CxP access to observe and witness equipment system installation and operation.
    f. Coordinate the training of Owner personnel, according to the Specifications.
    g. Prepare Operation and Maintenance manuals, according to the Specifications, including updating original sequences of operation to as-built conditions.
    h. Attend regularly scheduled commissioning meetings.
2. Warranty Period:
    a. Confirm that Subcontractors execute required seasonal or deferred functional performance testing.
    b. Confirm that Subcontractors correct deficiencies and make necessary adjustments to Operation and Maintenance manuals and as-built drawings for issues identified during the warranty period.
    c. Attend the end-of-warranty review.

F. Equipment Suppliers:
1. Provide requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in effect.
2. Provide information requested by CxP regarding equipment sequence of operation and testing procedures.
3. Assist in equipment testing and training per agreements with Subcontractors.

G. Mechanical, Electrical, Plumbing, Controls, TAB, and other Subcontractors:

H. Installing Subcontractors shall fill out construction verification checklists generated by the CxP.
1. The Subcontractor responsible for the startup and operational checkout of each commissioned system shall participate in functional performance testing and execute the test plans generated by the CxP.
2. Attend regularly scheduled commissioning meetings.
3. Ensure CxP access to observe and witness equipment system installation and operation
4. Submit required Contractor quality assurance test reports to Architect and Commissioning Provider for review.
5. Submit completed start-up reports for commissioned equipment signed by the factory-trained and authorized representatives performing the associated work.
6. Submit Testing and Balancing plan for review and completed TAB report to Architect and Commissioning Provider for review.

7. Submit completed System Readiness Checklists, with completed startup sheets attached, to Commissioning Provider. System functional performance testing shall not commence until the system is documented as ready for testing.
8. Submit operation and maintenance (O&M) manuals for systems being commissioned to Architect and Commissioning Provider for review.
9. Provide training for the Owner's facility staff for regular operations, maintenance, and troubleshooting.
10. Refer to applicable quality assurance and commissioning sections as noted in Article 1.2 for additional responsibilities.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Division Contractor for the equipment being tested. Equipment to be calibrated within the past year and in accordance with the manufacturer's recommendations.

B. Contractors to provide the electronic means (equipment) required to enter construction verification data from on-site if the Commissioning Provider utilizes a web-based program.

C. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed.

D. All testing equipment shall be of sufficient quality and accuracy to test or measure system performance as required by the specifications.

E. Datalogging equipment or software required to test equipment provided by the CxP shall not become the property of the CM/GC or Owner.

PART 3 - EXECUTION

3.1 MEETINGS

A. Pre-Construction Scoping Meeting: The CxP will schedule, plan, and conduct a pre-construction scoping meeting with the entire commissioning team in attendance. The CM/GC will ensure all relevant Subcontractors attend. The CxP will present an overview of the project's commissioning process and the commissioning team members will be identified and their responsibilities reviewed.

B. Miscellaneous Meetings: Other meetings will be planned and conducted by the CxP as construction progresses. Each Contractor is required to attend all meetings related to commissioning (pre-construction, construction progress, commissioning meetings, etc.) and to have personnel requested by CxP in attendance to facilitate quality control and coordinate

commissioning efforts. Contractors are to provide a review of project progress, a report on the status of issues, commissioning tasks, and scheduling for future commissioning tasks.

C. Warranty Review Meeting: Within 10 months of substantial completion and prior to completion of the warranty period, CxP will coordinate and facilitate a review meeting. The intent of the meeting will be to review the project design, construction, turnover, operation, and warranty issues. Contractor is required to have key project personnel in attendance and participating in the review for the purposes of making future project delivery improvements.

D. The CxP will distribute meeting minutes to all parties.

3.2 REPORTING

A. The CM/GC shall include the CxP on all OAC construction meeting minutes distribution.

B. The CM/GC shall include the CxP on all Requests For Information (RFI) and Change Order Requests (COR) related to commissioned equipment and systems.

C. The CxP will regularly communicate with all members of the commissioning team, apprising them of commissioning progress and scheduling changes through memos, progress reports, etc.

D. The CM/GC will respond to the CxPs deficiency record with resolution updates

E. The CM/GC will provide documentation as required for the CxP to compile a final Commissioning Report which summarizes all the tasks, findings, and documentation of the commissioning process. The report addresses the actual performance of the building systems in reference to the design intent and contract documents. The report includes a summary of commissioning activities, contact and warranty information, completed construction verification checklists, functional performance testing records, diagnostic monitoring results, identified deficiencies, recommendations for warranty review meeting, and ongoing commissioning effort.

3.3 SUBMITTALS

A. Refer to Division 01 General Requirements and Section "Submittals" and relevant Division sections for requirements.

B. The CM/GC shall provide the CxP submittals related to the commissioned equipment to review for conformance to the Construction Documents as it relates to the commissioning process. The review is intended primarily to aid in the development of functional performance test procedures.

C. The CM/GC shall respond to request for additional information from the CxP as needed to facilitate the commissioning process.

D. The CxP may request additional design and operations narrative from the design team and Controls Contractor regarding sequences of operations.

3.4 START-UP AND CONSTRUCTION VERIFICATION CHECKLISTS

A. The following procedures apply to all equipment to be commissioned, according to Article 1.7, Commissioning Scope.

B. Start-Up Plans:
1. The responsible Contractors shall develop detailed start-up plans for all equipment to be commissioned. The CxP will review start-up plans to confirm that there is written documentation that each of the manufacturer-recommended procedures is completed.
2. Subcontractors and equipment suppliers schedule startup and checkout with the OPM, CM/GC, and CxP.
3. All work to be installed in accordance with the manufacturer's instructions. The Subcontractors and vendors execute manufacturer installation procedures and start-up documentation. A copy of completed start-up checklists shall be provided to the CxP.
4. The start-up plans and documentation may be provided to the OPM and A/E for review.

C. Construction Verification Checklists:
1. The construction verification checklists are a formalized means to provide individual workers the criteria for a successful installation, adherence to the construction documents and to easily track construction progress.
2. Each assembly, component, equipment, system, and interface to be commissioned shall be verified by the installer at the site while work is underway and documented on the construction verification checklists. The Contractor is responsible for successfully completing installations, documenting this on the construction verification checklist forms, and correcting all deficiencies.
3. Construction verification checklists are developed by the CxP for all major equipment and systems being commissioned. The checklist documents all equipment components are installed and functional and confirms the as-built status of the equipment or system. These checklists also assist in confirming that the systems are complete and operational, so that the functional performance testing can be scheduled.
4. Construction verification checklists will be electronic and available via a web-based program. It is the Contractor's responsibility to have an electronic means of entering this data from on site.
5. Construction verification checklists shall be filled out and signed by the installing subcontractor for each piece of equipment. Only individuals who have completed or witnessed the line item task shall complete and sign the checklists.
6. Contractor shall periodically review the construction verification checklist schedule with the CxP allowing advance notice of activities of five (5) business days so that the CxP may witness as deemed necessary.
7. Calibration of all sensors shall be included as part of the construction verification checklists performed by the Contractors.

D. Deficiencies, Non-Conformance, and Approval in Checklists and Startup:
1. The Subcontractors shall clearly list any items of the start-up and construction verification procedures not successfully completed at the bottom of the form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CxP within two (2) days of test completion.
2. The CxP will verify the accuracy of the completed start-up forms and construction checklists compared with actual field installation and recommends approval to the OPM.
3. If CxP identifies more than a 10 percent discrepancy rate during confirmation of construction verification checklists, the Contractor shall correct all deficiencies and revalidate all items covered by that checklist and resubmit new checklists.

4. The cost of reconfirmation of construction verification checklists due to equipment or construction deficiencies is the responsibility of the Contractor and subject to deductive change order at Owner's/Construction Manager's discretion. Correction of deficiencies and revalidation are the responsibility of the Contractor and are not subject to time extensions or delay claims.

3.5 FUNCTIONAL PERFORMANCE TESTING

A. Functional performance testing for each system in the commissioning scope shall be executed by the Subcontractor responsible for the startup and operational checkout of the system.

B. The following procedures apply to all equipment to be commissioned, according to Article 1.7, Commissioning Scope. This sub-section applies to all commissioning functional performance testing for all divisions.

C. Objectives and Scope: The objective of functional performance testing is to demonstrate that each system is operating according to the documented design intent and Construction Documents. Functional performance testing comprises a full range of tests to verify that all components, equipment, systems, and interfaces between systems operate correctly. This includes all operating modes, interlocks, control sequences, and responses to emergency conditions. All verification procedures are directed, witnessed, and documented by the CxP.

D. Development of Test Procedures: The CxP develops specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Prior to execution, the CxP provides the test procedures to the Subcontractors who review the tests for feasibility, safety, equipment, and warranty protection. The CxP may submit the tests to the A/E team for review.

E. Test Methods:
1. Functional performance testing and verification may be achieved by direct manipulation of system inputs (i.e., heating or cooling sensors), manipulation of system inputs with the building automation system (i.e. software override of sensor inputs), trend logs of system inputs and outputs using the building automation system, or short-term monitoring of system inputs and outputs using standalone data loggers. A combination of methods may be required to completely test the complete sequence of operations. The CxP determines which method, or combination, is most appropriate.
2. Setup: Each test procedure is performed under conditions that simulate normal operating conditions as closely as possible. The Sub executing the test provides all necessary system modifications to produce the specified conditions (flows, pressures, temperatures, etc.) necessary to execute the test. At completion of the test, the Sub returns all affected building equipment and systems to their pre-test conditions.
3. Sampling: Multiple identical pieces of non-life-safety or non-critical equipment may be functionally tested using a sampling strategy. The CxP shall establish sampling protocol with approval of the OPM, and at the time of testing select sample test locations for identical pieces of equipment. Where simulation of conditions or altering of setpoints or values is required to achieve an operating or failure mode for testing, the Contractor must receive CxP approval. If, after three attempts at testing the specified sample percentage, failures are still present, then all remaining units are tested at the Contractors' expense.

F. Coordination and Scheduling: Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.

G. Contractor shall coordinate functional performance testing with CxP, the CM, and the Owner and notify them five (5) business days prior to testing so that they may witness and document the test results. All Contractors involved with specific assemblies, components, equipment, systems, and interfaces shall have qualified installers and technicians present at the same time working together to perform testing and demonstrate correct performance through all operating and failure modes and compliance with contract documents and manufacturer's recommendations.

H. With Owner and CM oversight, the CxP is responsible for witnessing functional performance testing and recording the results and deficiencies. The following sequential priorities are followed:

1. Equipment is not "temporarily" started (for heating or cooling), until pre-start checklist items and all manufacturers' pre-start procedures are completed and moisture, dust, and other environmental and building integrity issues have been addressed.
2. Functional performance testing does not begin until construction verification, start-up, controls verification of installation (all sequences and points), and TAB is completed for a given system.
3. The controls system and equipment it controls are not functionally tested until all points have been calibrated and construction verification checklists are completed.

I. Contractors are responsible for completing and coordinating their work with all trades prior to testing, preplanning testing procedures, ensuring necessary staff and resources are on hand, and expediting testing. This includes, but is not limited to, completing testing and balancing by the HVAC Contractor required for successful functional performance testing, pre-testing of the systems (completing FPT) prior to testing with CxP. Pre-testing will include submission of trending per the request of CxP. Failure to complete or coordinate work, preplan, or have staff and resources available to carry out testing will result in retesting.

J. Problem Solving: The CxP may recommend solutions to deficiencies identified during functional testing. However, the burden of responsibility to solve, correct, and retest deficiencies is with the CM/GC, Subcontractors, and A/E.

3.6 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS

A. Documentation:
1. The CxP witnesses and documents the results of all functional performance tests using forms developed for that purpose. Prior to testing, these forms are provided to the OPM for review and approval.

B. Non-Conformance:
1. The CxP records the results of the functional test on the procedure or test form. All deficiencies identified during the verification testing are documented on a standard Issues Log form and reported to the PM, Contractors, and Subcontractors. The deficiency report includes all details of the components or systems found to be non-compliant with the parameters of the test plans. The report details the adjustments or alterations required to correct system operation and identifies the responsible party.
2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxP. In such cases, the deficiency and resolution will be documented on the procedure form.
3. Deficiencies that cannot be corrected during testing will be documented on the Issues Log and subject to retest. Retesting will continue until no deficiencies remain or by Owner's request.

4. Retesting is required when testing cannot be successfully completed. Deficiencies requiring include:
   a. Incomplete work and/or coordination with others.
   b. Inadequate preparation of systems for testing.
   c. Inadequate preplanning.
   d. Inadequate staff, equipment, tools, or resources for testing.
   e. Material, equipment, or construction deficiencies.
   f. Incomplete or failed test due to reasons under the Contractor's responsibility.
5. If there is a dispute about a deficiency or who is responsible:
   a. The deficiency is documented on the Issues Log and a copy given to the OPM and CM/GC.
   b. Resolutions are made at the lowest management level possible. Additional parties are brought into the discussions as needed. Final interpretive authority is with the A/E team. Final acceptance authority is with the PM. The CxP documents the resolution process.
   c. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency and notifies the CxP that the equipment is ready to be retested.
   d. The CxP reschedules the test, and the test is repeated until satisfactory performance is achieved.

C. Cost of Retesting:
1. The cost of retesting is the responsibility of the Contractor and subject to deductive change order. Correction of deficiencies and retesting are the responsibility of the Contractor and are not subject to time extensions or delay claims.

D. Approval:

1. The CxP makes formal approval of the functional performance test after review. The CxP recommends acceptance of each test to the OPM. The OPM gives final approval on each test.

3.7 OWNER'S TRAINING

A. Refer to Division 01 General Requirements and Section "Demonstration and Training" and relevant Division sections for requirements.

B. The Contractor is responsible for developing a cohesive training plan for all Divisions and Sections of work where training is specified. See technical sections for specified minimum training hours for each component and system.

C. The CM/GC shall provide the CxP a preliminary training plan and schedule related to the commissioned equipment to review and finalize incorporating comments received. The plan should include agendas including topics and objectives to be covered for each section, the instructor's name and contact information, the anticipated duration and schedule for each session, a formal training record listing of attendees, and a training evaluation form. Develop the training schedule, including number of hours for each component or system, in coordination with the CxP and CM that complies with the Owner's and CxP's personnel availability.

D. The CxP shall provide each trainee with a Training Evaluation Form and at completion of training, collect forms for review. Based on evaluations and OPM training review, Contractor shall repeat training sessions which were determined were inadequate or incomplete.

3.8 O&M DATA AND CLOSEOUT SUBMITTALS

A. Refer to Division 01 General Requirements and Section "Closeout Submittals" and relevant Division sections for requirements.

B. The CM/GC shall provide the CxP closeout submittals related to the commissioned equipment to review and compile into a Recommissioning Systems Manual as required.

3.9 DEFERRED TESTING

A. Unforeseen Deferred Tests: If any test cannot be completed due to the building structure, required occupancy condition, or other deficiency, the functional testing may be delayed upon approval of the OPM. These tests are conducted in the same manner as the seasonal tests as soon as possible.

B. Seasonal Testing: Seasonal variation in operations or control strategies may require additional testing during the opposite season to verify performance of the HVAC system and controls. During the warranty period, seasonal testing and other deferred testing is completed as required to fully test all sequences of operation. The CxP coordinates these activities. Tests are executed and documented, with deficiencies corrected by the appropriate Subcontractors. Any final adjustments to the Operation and Maintenance manuals and as-builts due to the testing are also completed.
   1. Two additional functional performance sessions are to be completed for the following systems:
      a. Air Handling Units / Rooftop Units.
      b. Chilled Water Systems.
      c. Heating Hot Water Systems.

END OF SECTION 01 91 13

SECTION 02 41 16 - DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Furnishing labor, materials and equipment necessary for demolition, dismantling, cutting and alterations as indicated, specified, or required for completion of the Work. Includes items such as the following:
   1. Protection of existing improvements to remain.
   2. Cleaning existing improvements to remain.
   3. Disconnecting and capping utilities.
   4. Removing debris, waste materials, and equipment.
   5. Removal of items for performance of the Work.
   6. Salvageable items to be retained by the Owner.

B. In general, the Contractor shall endeavor to limit conventional demolition to those elements and materials not dismantled for required salvage and those that cannot otherwise be cost effectively recovered for reuse and recycling. The Contractor's work plan shall favor means and methods that result in the lowest percentage and volume of removed improvements and materials being disposed of as waste by burning, at a landfill and similar disposal.

C. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 01 11 00 - Summary of Work.
   3. Section 01 50 00 - Construction Facilities and Temporary Controls.
   4. Section 01 73 29 - Cutting and Patching.
   5. Section 01 74 19 - Construction and Demolition Waste Management.
   6. Division 22 –- Plumbing.
   7. Division 23 –- HVAC.
   8. Division 26 –- Electrical.

1.2 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings indicating the extent of items and systems to be removed. Indicate items to be salvaged or items to be protected during demolition. Indicate locations of utility terminations and the extent of abandoned lines to be removed. Include details indicating methods and location of utility terminations.

B. Procedural Proposal for Selective Demolition: Describe nature of the work, and performance; utilities that may be disturbed, relocated, and temporarily out-of-service; and proposed methods of protection, stabilization, and pollution control. Architect will not review for safety procedures nor the potential for damage and creation of hazardous conditions.

C. Regulatory Agency Authorization: Submit for Architect's review where written authorization is required for demolition work. This requirement shall not relieve Contractor of responsibility for obtaining required authorizations.

D. Hidden Conditions Report: Detailed descriptive report of nature and scope of conditions encountered.

1.3 QUALITY ASSURANCE

A. Perform the Work of this section by workers skilled in the demolition of buildings and structures. Perform the Work of this section under direct superintendence at all times.

B. Prior to commencement of Work, schedule a walkthrough with the OAR, to confirm Owner property items have been removed from scheduled Work areas. Identify and mark remaining property items and schedule their removal.

C. Coordinate demolition for the correct sequence, limits, and methods. Schedule demolition Work to create least possible inconvenience to the public and facility operations.

D. Related Standard: ANSI/ASSE A10.6.

1.4 PROJECT CONDITIONS

A. Drawings may not indicate in detail all demolition Work to be performed. Examine existing conditions to determine the full extent of required demolition.

B. Repair damage to existing improvements or damage due to excessive demolition.

C. Provide all measures to avoid excessive damage from inadequate or improper means and methods, improper shoring, bracing or support.

D. If conditions are encountered that varies from those indicated, promptly notify the Architect for clarification before proceeding.

E. Utility Services: Identification and location of utilities both inside and outside of buildings is the Contractor's responsibility. Maintain existing utilities indicated to remain in service, protect against damage due to demolition work.

F. Temporary Facilities and Controls: Minimize air, noise, water and soil pollution; provide as necessary to mitigate and abate nuisances resulting from demolition activities that may adversely affect Owner's occupancy, and to comply with regulatory requirements bearing on the Work.
   1. Prevent damage to the building due to exposure to weather. Provide weatherproof and insulated temporary enclosure and all other work necessary to prevent disruption to occupancy, damage and loss to the Library.
   2. Temporary shoring supports and all other facilities necessary for the Work are the Contractor's responsibility at no additional cost to the Owner.
   3. Environmental Controls: In enclosed spaces; Ambient temperature between 50- and 90-degrees F and adequate ventilation for safe working conditions.

PART 2 - PRODUCTS

2.1 HANDLING OF MATERIALS

A. Items scheduled for salvage by the Owner shall be delivered to a location designated by the OAR. Items shall be cleaned, packaged and labeled for storage.

B. Items scheduled for reuse shall be stored on the Project site and protected from damage, theft and other deleterious conditions.

PART 3 - EXECUTION

3.1 GENERAL

A. Protection:
1. Do not commence demolition until safety partitions, barricades, warning signs and other forms of protection are installed. Refer to Section 01 50 00 - Construction Facilities and Temporary Controls.
2. Provide safeguards, including warning signs, lights and barricades, for protection of workers, occupants, and the public.

B. If safety of existing construction appears to be endangered, take immediate measures to correct such conditions; cease operations and immediately notify the OAR.

C. Erect and maintain dust-proof partitions and closures as required to prevent the spread of dust or fumes to occupied portions of the building.

D. Provide weatherproof closures for exterior openings resulting from demolition work.

E. Locate, identify, and disconnect utility services not indicated to remain. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of building.

3.2 DEMOLITION

A. Do not throw or drop materials. Furnish ramps or chutes as required by the Work.

B. Remove existing construction only to extent necessary for proper installation of Work and interfacing with existing construction. Cut back finished surfaces to straight, plumb or level lines as required for a smooth transition.

C. Where openings are cut oversize or in improper locations, replace or repair to required condition.

3.3 CUTTING EXISTING CONCRETE

A. Cutting of existing concrete shall be performed by skilled workers familiar with the requirements and space necessary for placing concrete. Perform concrete cutting with concrete cutting wheels and hand chisels. Do not damage concrete intended to remain.

B. Extent of cutting of structural concrete shall be as indicated on Drawings. Cutting of non-structural concrete shall be as indicated on Drawings or as reviewed by the Architect or structural engineer. Replace concrete demolished in excess of amounts indicated.

C. Prior to cutting or coring concrete, determine locations of hidden utilities or other existing improvements and provide necessary measures to protect them from damage.

3.4 REMOVAL OF EXISTING PLUMBING AND ELECTRICAL EQUIPMENT AND SERVICES

A. Remove existing plumbing and electrical equipment fixtures and services not indicated for reuse and not necessary for completion of the Work. Remove abandoned lines and cap unused portions of existing lines.

3.5 REMOVAL OF OTHER MATERIALS

A. Masonry: Cut back to joint lines and remove mortar without damaging units to remain. Allow space for repairs to backing where applicable.

B. Woodwork: Cut or remove to a joint or panel line.

C. Sheet Metal: Remove back to joint, lap, or connection. Secure loose and unfastened ends or edges and provide a watertight condition. Re-seal as required.

D. Glass: Remove broken or damaged glass and clean rebates and stops of glazing channels.

E. Modular materials such as acoustical ceiling panels, resilient tile, or ceramic tile: Remove to a natural joint without leaving damaged or defective Work where joining new Work. After flooring removal, clean substrates to remove setting materials and adhesives.

F. Plaster: Saw cut plaster on straight lines, leaving a minimum 2-inch width of firmly attached metal lath for installing new lath and plaster.

G. Remove existing improvements not specifically indicated or required but necessary to perform Work. Cut to clean lines, allowing for installation of Work.

H. Curtain Wall and Glazing: Salvage removed IGU's and selected portions of glazed curtain wall deliver to Owner as directed. Exercise care in removal work and anticipate subsequent installation of new building enclosure.

I. Exterior Demolition: Site clearing and grubbing is specified in Division 31 Sections. Completely demolish foundation walls below existing ground surface. Demolish and remove below-grade wood and metal construction. Break up below-grade concrete slabs.

1. Cut concrete and masonry at juncture with construction to remain.
2. Completely fill below-grade areas and voids resulting from demolition work. Provide fill complying with Section 31 10 00 requirements.

J. Paint, Adhesives and Coatings: Remove from substrate where these would impair appearance, durability and serviceability of new work; provide mechanical means to scarify substrate and establish appropriate profile with uniform texture for mechanical bond of new coating.
1. Coordinate with requirements for new work and finishes and verify that existing coatings and other conditions have been removed and each substrate is ready to receive new work with preparatory work limited to cleaning and priming.

K.

3.6 PATCHING

A. Patch or repair materials to remain when damaged by the performance of the Work of this section. Finish material and appearance of patch and/or repair Work shall match existing.

3.7 CLEANING

A. Clean existing materials to remain with appropriate tools and equipment.

B. Protect existing improvements during cleaning operations.

C. Debris shall be dampened by fog water spray prior to transporting by truck.

D. Debris pick-up area shall be kept broom-clean and shall be washed daily with clean water.

E. Remove waste and debris, other than items to be salvaged. Turn over salvaged items to Owner, or store and protect for reuse where required. Continuously clean up and remove items as demolition Work progresses.

F. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 03 11 00 – CONCRETE FORMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for formwork for cast-in-place concrete.
   1. Comply with requirements and criteria in the General Notes on S-Series structural drawing sheets.

B. Products Installed but not furnished under this Section: Built-in sleeves, thimbles, dovetail slots, reglets, and anchors, wood blocking, inserts, and bolts for connection of other materials.

C. Related Sections:
   1. Section 03 20 00 Concrete Reinforcement.
   2. Section 03 30 00 Cast-In-Place Concrete.
   3. Section 07 13 00 Waterproofing at Pits and Sumps.
   4. Section 07 26 00 Vapor Control.
   5. Section 31 22 30 Grading.

D. Definitions: Comply with ACI 116R Cement and Concrete Terminology unless otherwise required.
   1. As-cast Concrete Surfaces Exposed to View: May be referred to as Smooth Form Finish and indicated on A-drawings. Characterization shall be for convenience only and shall not be interpreted as restricting the appearance, quality and character of the work required to texture alone. Unless otherwise required for as-cast appearance shall be dependent on processing of surfaces by neither additive nor subtractive means following removal of formwork.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Coordinate formwork with requirements for components to be embedded in concrete including but not limited to conduit, mechanical, and plumbing penetrations, reinforcing and the following work:
   1. Division 05: Metal fabrications, stair, elevator and guardrail attachments.
   2. Division 11: Façade maintenance and fall protection equipment.

1.3 SUBMITTALS

A. Product Data: Include specifications and installation instructions for proprietary materials and items as required, including form coatings, manufactured form systems, ties, moisture barriers and accessories.
   1. Formwork Facing Materials: Data on form facing materials proposed for smooth-form finish. Indicate the number of reuses proposed for facing materials, criteria for evaluating whether facings are suitable for reuse and remedial measure to maintain prospective service life.

B. Shop Drawings: Indicate pertinent dimensions, materials, and arrangement of joints, ties and accessories for formwork and shores and reshores. Architect's review is for general

architectural applications and features only. Structural capacity to resist imposed loads is the responsibility of the Contractor.

1. Calculations and Drawings: Stamped by Registered Structural Engineer in the State where Project is located for conditions required by OSHA or constituting life-safety performance.
2. On-Grade Concrete Slab: Details of supports for reinforcing and stabilizing form-work features without puncturing vapor barrier.
3. As-Cast Concrete Surfaces Exposed to View in the Completed Work: Show the general construction of forms, formed joints, reveals, form tie locations, and pattern of form placement, and other items that affect the exposed concrete visually. Revise as necessary to represent formwork used in accepted mock-up and to accommodate proposed frequency of reutilization.
4. Formwork Facing Materials: Data on form facing materials proposed for as-cast finish. Indicate the number of reuses proposed for facing materials, criteria for evaluating whether facings are suitable for reuse and remedial measure to maintain prospective service life.
5. Components to be Embedded in Concrete Work: Provide comprehensive coordination drawing for location and installation of all items of the work in coordination with steel fabrications.
6. Indicate accommodation of characteristics of Project-specific mix design as necessary.

C. Reshoring and Backshoring Plans: When reshoring or backshoring are required or permitted, submit procedures and plans of operations, before use, sealed by a professional Engineer licensed in the state where Work will be performed.

D. Samples: When directed submit samples of formwork materials.

E. Quality Assurance:
1. Slab Survey Information: Reference 03 30 00 for survey and reporting requirements.

F. Mock-Up for Formed Concrete: Provide formwork as necessary for work of Section 03 30 00 and to demonstrate forming techniques proposed for use in the final work. Demonstrate schedule, sequence and method for form removal. Demonstrate procedure for reuse of formwork.
1. Coordinate with Section 03 30 00 for mix design requirements.
2. Demonstrate placement of form ties and related accessories; verify compliance with pattern and appearance requirements for the Work.

1.4 QUALITY ASSURANCE

A. Design, construct, erect, maintain and remove forms, shores and related structures for cast-in-place concrete work in compliance with requirements and tolerances in the American Concrete Institute Standard ACI 347, "Recommended Practice for Concrete Formwork." Formwork shall produce as-cast surfaces complying with Tolerance requirements of Section 03 30 00.

B. Forms and Shoring: Designed by the Contractor's Professional Engineer.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Formwork, shoring and bracing shall provide completed concrete surfaces conforming to sizes, shapes, lines, grades and dimensions indicated, with openings, offsets, keyways, recesses, anchorages, inserts and other features as required. Formwork shall be removable without damage to concrete and adjacent surfaces.
   1. Form, shoring and reshoring design shall be the sole responsibility of the Contractor and comply with ACI 301 and 318.
   2. Forms shall impart a uniform surface to the concrete that is free of mottling and color variation due to absorption of moisture, chemical reactions or other cause.
   3. Provide broad-footed pedestals or other accessory components to support chairs, form-boards and all similar components without puncturing vapor barrier at grade-supported concrete flatwork.

B. Performance Requirements: The Contractor shall determine construction loads and all other loads including safety factors that must be supported by formwork, shoring, re-shoring and related temporary supports throughout the course of the Work.
   1. Contractor shall ensure formwork, shoring and all related support work comply with regulatory requirements including but not limited to safety regulations and the following.
      a. ASCE 37, Design Loads on Structures during Construction.
   2. Concrete Forms: Deigned for specific characteristics of Project mix design including required admixtures, placement method, method of cure and finishing techniques.
   3. Concrete Forms: Deigned for Full Liquid Head loading, and as necessary to accommodate extended cure time of 56 days and other special conditions resulting from the use of high fly-ash content in the mix design.
   4. Board Formed Concrete: Exercise a high level of craftwork and skill in the design and construction of forms to produce controlled appearance required.

2.2 MATERIALS

A. Form Sheathing and Liners: Plywood, metal, metal-framed plywood faced and other acceptable panel-type materials, minimize number of joints and conform to join patterns where indicated. Contractor is encouraged to reduce materials consumption for the Work by utilizing form sheathing that may be reused. Consideration shall also be given to form liners where they will enable reuse of sheathing.
   1. Concrete Forming Panels: Comply with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
   2. Chamfer Strips: Prefabricated rigid wood or PVC chamfer strips to produce 0.75-inch radius unless otherwise indicated.
   3. Lumber: Dressed on two edges and one side.

B. Form Ties: Prefabricated, adjustable length, removable or snap-off metal ties; minimum 1-inch concrete coverage over embedded remnants and maximum 1 inch diameter holes from removed ties.
   1. Site fabricated and wire ties are not acceptable.
   2. Provide pre-cast concrete plugs coordinate with form-ties to fill holes following removal.

C. Form Release Coating: Provide water-based, VOC content 100 grams per liter or less, commercial formulation form-coating compounds compatible with forming materials and

subsequent coatings, adhesives and treatments that will not bond with, stain nor adversely affect concrete surfaces.

1. Atlas BioGuard (www.atlasform.com)
2. BioRelease EF (www.daytonsuperior.com)
3. Star Seal ER Bio_Release (www.vexcon.com)
4. SEI Form Release _ GCC_100 FRW _ Water Based (www.seichemical.com)

D. Sub-grade Pipe Penetration Flange: Cast iron providing mechanical joining of interior components and flexible exterior joint extending beyond the wall line minimum one length of ductile iron pipe. Size sleeve to accommodate pipe or other penetration with allowance for water-stopping filler.

E. Waterstops: Chemically modified hydrophilic rubber with integral stainless steel reinforcing mesh. Waterstop shall exhibit controlled expansion when exposed to water. Nominal 0.75 inch by 0.5-inch strips; MC-2010M by Adeka Ultra Seal (800) 999-3959, www.adeka.com.

1. Provide accessory components to seal waterstop joints, and for cleaning and priming of substrate and to bond seal to concrete approved by waterstop manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Protection: Support imposed loads until concrete has cured adequately to support them. Provide crush plates and other protection to prevent damage to concrete surfaces during stripping.

B. Prevent movement and deformation of formwork and liners during concrete placement; shore, brace, block and support as necessary.

1. Below Grade Penetrations: Give particular attention to the stability of components and ensure they are tightly bonded in the completed concrete work such that they will not move or be subject to displacement nor otherwise compromise sub-grade waterproofing work of Section 07 13 26.
2. Provide specified flange for sub-grade pipe penetrations. Apply waterstop to seal bond surface of sleeve to concrete. Coordinate location and sizing of sleeve with mechanical, plumbing and electrical to be routed through the sleeve. Provide water-tight filling of annular gap as required for work of Section 07 13 26.

C. Prevent leakage of cement paste at joints, openings and penetrations in formwork.

1. Metal Decks with Concrete Topping: Seal edges and penetrations of decking to receive concrete and prevent seepage of cement paste.

D. Temporary Openings: At inconspicuous locations for cleanout and inspection of forms and placing of concrete.

E. Form all concrete surfaces. Do not use earth forms without prior written approval. Clean formwork and surfaces to receive concrete immediately prior to placement of concrete, remove debris and contaminants which might impair quality of completed work.

1. Formed Concrete Exposed to View: Provide Contractor's best craft, care and attention to achieve a controlled appearance of concrete work with the desired texture, features and characteristics. Unless otherwise acceptable, design formwork for pours to stop at floor lines (nominally 14 feet and 24 feet AFF).

F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints. Kerf inserts for forming keyways, reglets, and recesses.

G. Construct formwork so concrete surfaces conform to the tolerance limits of ACI 117. As-cast Work Exposed to View: Set the facing materials in an orderly manner arranged per approved submittals, matching the Reference Control Sample and approved mock-up.

H. Waterproofing and Vapor Barrier: Coordinate formwork with Section 07 13 26 and Section 07 26 00 requirements. Vapor barrier at concrete flatwork shall be neither punctured nor damaged for any reason. Damage to vapor barrier will be grounds for rejection of the work and removal of work in-place as necessary for Contractor to replace damaged vapor barrier (repair of barrier will not be acceptable) without modification to Contract Sum nor Time. Necessary penetrations through waterproofing shall be sealed per Section 07 13 26 requirements.
   1. Should water accumulate on or above vapor barrier prior to placement of concrete the water shall be removed by pumping of other acceptable means. Neither puncture vapor barrier nor damage waterproofing to encourage drainage or run-off of water.

I. Re-Used Forms and Liners: Re-use limited to materials intended for multiple use. Prepare as specified for new, single-use forms, remove concrete and coating residues and restore as necessary to provide acceptable surface condition; damaged and deteriorated forms shall not be used.

J. Form Coatings: Apply to contact surfaces, comply with manufacturer's recommendations, prevent accumulation of coatings in formwork, and do not coat bond surfaces of existing concrete and embedded items.
   1. Coat forms and liners as necessary to prevent staining of concrete work.

3.2 JOINTS

A. Construction Joints: Horizontal and vertical, locate as indicated, and as specified in ACI 301, Section 2.2.2.5. Impair neither the strength nor appearance of the Work, place perpendicular to main reinforcement and with keyways 1.5 inches deep minimum, keyed bulkheads may be used.

B. Formwork Joints: Tight and regular, use minimum number of joints necessary for Work indicated.
   1. Form Ties: Provide as indicated in concrete work exposed to view in the interior of the building, exterior foundation walls, planter walls and seating walls. Where not indicated in Drawings, provide uniform, even spacing at cast-in-place concrete exposed to view.

C. Waterstops: Provide as a continuous seal at subgrade construction joints such as footing wall intersection, on-grade slab and wall, where new subgrade concrete work abuts existing concrete structure and at similar locations where subterranean water could enter the building due to joints in concrete work.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. Embedded Items and Built-ins: Position in forms as necessary to accommodate Work of other trades, ensure correct placement, size and location for openings, recesses, anchors,

and items built into forms. Use setting diagrams, templates and directions provided by suppliers of items anchored to and cast into cast-in-place concrete.

B. Edge Forms and Screed Strips for Slabs: Set to obtain required elevations and contours in finished surface, support screed strips with strike-off templates or accepted compacting type screeds.
   1. Coordinate Metal Deck and Topping Slab edge with stair structure and slab edges exposed to view in completed structure.
   2. Exposed Slab Edge at Atrium: As indicated in Drawings and to comply with Section 05 12 00 requirements for exposed structural steel components.

3.4 SHORES AND SUPPORTS

A. Arrange shores as indicated on S-Series drawings and as otherwise required for the Work.

B. Shore construction to ensure distribution of loads throughout structure. Do not impose loading conditions for which the structure was not designed nor has not achieved sufficient strength to carry.

C. Remove shores and supports in a planned sequence, do not damage partially cured concrete. Prevent deflection and excessive loading of concrete.

3.5 REMOVAL OF FORMS

A. Formwork not supporting weight of concrete, may be removed after cumulatively curing at not less than 50 degrees F (10 degrees C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by stripping, and provided curing and protection operations are maintained.

B. Tolerances: Comply with ACI 117, except when specifically stated otherwise tolerances shall be total amount allowed; for example, a tolerance of 0.75 inch shall be interpreted to mean plus 0.375 and minus 0.375 inch for a total of 0.75 inch.
   1. Work the Architect determines has dimensional variations that adversely affect appearance and suitability for the purpose intended shall be replaced regardless of compliance with tolerance of ACI 117.
   2. To be acceptable Work must comply with tolerances when fully cured and temporary supports have been removed.

END OF SECTION

SECTION 03 20 00 – CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes reinforcing bars, welded wire fabric, supports and accessories for cast-in-place concrete.
   1. Comply with requirements of the General Structural Notes on S0.01 AND S0.02; completed structures shall support loads and resist forces per criteria provided in Structural Design Criteria.

B. Related Sections:
   1. Section 03 11 00 Concrete Forming
   2. Section 03 30 00 Cast-In-Place Concrete

1.2 REFERENCES

A. Comply with requirements of the following, including modification required by applicable Codes.
   1. American Concrete Institute, ACI 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures.
   2. American Concrete Institute, ACI 318 Building Code Requirements for Reinforced Concrete.
   3. American Welding Society, AWS D1.4 Structural Welding Code Reinforcing Steel.
   4. Concrete Reinforcing Steel Institute (CRSI), Manual of Standard Practice.
   5. ACI 347R – Guide to Formwork for Concrete
   6. California Building Code (CBC), 2022

B. Allowable Tolerances fabricating/placing tolerances shall be in conformance with ACI 301.

1.3 SUBMITTALS

A. Submit product data including specifications and installation instructions for all proprietary materials and reinforcement accessories.

B. Shop Drawings: For fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 show bar schedules, stirrup spacing, diagrams of bent bars, arrangement and support of concrete reinforcement, and coordination with embedded and cast-in items.

C. Mill Certificates: Submit steel producer’s certificates of mill tests for reinforcing steel.

1.4 QUALITY ASSURANCE

A. Fabricator of steel reinforcing shall comply with requirements for Local /Regional Materials and Referenced Standards.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement from the mill in securely tied bundles, each bundle limited to one size and grade of reinforcement. Identify each bundle with readily visible metal or plastic tags identifying the reinforcement by the same item marking as on the approved shop drawings; tags shall also identify the mill, heat or melt number, and the grade and size of reinforcement.

B. Each stack shall contain only bars with the same identifying label.

C. Store reinforcement off the ground, protected from the elements and foreign material which could adversely affect its bond with concrete.

PART 2 - PRODUCTS

2.1 REINFORCING MATERIALS

A. Reinforcing Bars: Provide Grade and Type as indicated in the General Structural Notes and as otherwise required for the Work.

B. Steel Wire:
1. Cold-Drawn Plain Wire: ASTM A 82.
2. Deformed Wire: ASTM A 496.

C. Welding Electrodes: AWS A5.1, low hydrogen, E70 series.

D. Supports for Reinforcement: Comply with CRSI specifications for bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing accurately in location required and to resist movement during concreting operations.
1. Exposed Concrete: Legs of supports in contact with forms or within ½" of exposed concrete surface, shall be plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
2. Supports Standing on Vapor Barrier: Configure to prevent puncture and other damage to the vapor barrier.

E. Reinforcing Couplers: Type indicated on General Structural Notes and as otherwise required for the Work.

F. Deformed Bar Anchors: Nelson, flux filled deformed bar anchors, type D2L, as manufactured by Nelson Stud Welding or equal (no known equal)
1. Deformed Bar Anchor material shall be made from cold rolled, deformed steel reinforcing bars conforming to ASTM A496.
2. Deformed Bar Anchor material shall have a yield strength, fy, equal to 70,000 pounds per square inch.
3. Deformed Bar Anchor material shall have a tensile strength, fy, equal to 80,000 pounds per square inch.

2.2 FABRICATION

A. Coordinate reinforcing with anchors, shear studs, block-outs, conduits, sleeves, and other items, to be cast in concrete. Fabricate reinforcing to eliminate conflicts with the placement of embedded and cast-in items.

B. Field fabrication will be allowed only if Contractor has equipment to properly fabricate steel as determined by the Architect.

C. Fabrication of reinforcement shall begin only after approval of bar lists and shop drawings, with each item of reinforcement fabricated in conformance with such approved documents

PART 3 - EXECUTION

3.1 INSTALLATION

A. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
   1. Coordinate reinforcing for on-grade concrete slabs with vapor barrier and waterproofing requirements.

B. Place reinforcement to obtain minimum concrete coverage acceptable to Architect and General Structural Notes. Continue reinforcement across construction joints.
   1. Allow observation by Architect at completion of placement.
   2. Reinforcing partially embedded in concrete shall not be field bent except as indicated or specifically approved in advance.
   3. Spacing. As indicated, and to comply with ACI 318.

C. Welding: Acceptable only where required on the drawings and shall comply with AWS D 1.4
   1. Welding material, wire cuttings, and tramp metal shall be thoroughly cleaned from forms for exposed concrete before any concrete is placed.
   2. Do not use tack welds in welding processes.
   3. Welding is not permitted within two bar diameters of cold bends.

D. Clean reinforcement of loose rust and mill scale, earth, ice, and contaminants that may inhibit or compromise bond with concrete.

E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.2 FIELD QUALITY CONTROL

A. As a minimum, the Owner's Quality Control Inspector will test and inspect the work to comply with the requirements of CBC Chapter 17 Special Inspections and Tests and requirements of S0.01 and S0.02. In addition to other required inspections, the following are subject to Special Inspection.
   1. Placement of reinforcing steel.
   2.
   3. Installation of deformed bar anchors to be tested in accordance with Section 7.1 of AWS D1.1.
   4. Testing and inspection of mechanical splices and reinforcing couplers to conform to manufacturer's recommendations and ICC-ES requirements.
   5. Where reinforcement cannot otherwise be kept properly aligned, provide additional bracing ties, stirrups, and other items as necessary.

END OF SECTION

SECTION 03 30 00 – CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for cast-in-place concrete as indicated and specified herein.
   1. Comply with requirements of the General Structural Notes on S-Series drawings; completed structures shall support loads and resist forces per criteria therein.

B. Definitions: Comply with ACI 116R Cement and Concrete Terminology unless otherwise required.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Convene sufficiently in advance of the start of concrete work to allow for adjustments to work plan, means and methods as necessary to comply with Contract requirements. Review concrete design mixes, submittals, work schedule and sequence, inspection and testing protocols, curing requirements, finish appearance and coordination of penetrations to accommodate building services and other construction.
   1. Compliance with tolerance requirements for F_L and F_F measurements.
   2. Coordination with Section 03 35 20 for work of this Section to receive special concrete finish.
   3. In addition to lower tier contractors, the ready-mix producer and all other affected parties shall attend.

B. Coordinate Schedule and sequence for work of this Section with finish flooring in Sections 09 30 00, 09 65 00, 09 67 00 and 09 68 13 to permit a minimum of 90 days cure while protected from precipitation and other sources of moisture (including moisture generating construction operations) prior to earliest date for beginning of finish floor application.
   1. Coordination of measures to prevent excess moisture and alkalinity in concrete slabs for grade supported and composite construction. Perform work in accordance with Contractor's approved vapor emission control plan.

C. Wash-Down of Concrete Supply Trucks and Related Equipment: Not permitted on Site except where Contractor demonstrates acceptable means for collection and containment of effluent for return to ready-mix plant by supply vehicle.

1.3 SUBMITTAL.S

A. Product Data: Required for each material and product to be incorporated into the Work.
   1. Building Product Disclosure and Optimization – Environmental Product Declarations (EPD's): Provide Manufacturers Life Cycle Analysis conforming to ISO 14044, Product-specific Type III EPD.
   2. Building Product Disclosure and Optimization – Sourcing of Raw Materials, Recycled Content: Certification from manufacturer stating the percentage by weight of post-consumer and pre-consumer (post-industrial) recycled content.

B. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.

C. Laboratory Test Reports: Required for concrete materials and mix design.

D. Material Certificates: Signed by manufacturer and Contractor; Submit in lieu of laboratory test reports as acceptable to Architect, demonstrate compliance with requirements.
1. Certification of admixtures compatibility by Contractor's approved technician.

E. Mix Design: Written proposal for each concrete mix and strength required submit 15 days prior to start of Work. The mix design shall list the following:
1. All materials and admixtures and their proportions.
2. Water-cement ratio, slump, and aggregate grading.
3. Evidence that mix design meets the strength requirements: Compression test data (field experience method) or results of testing (trial batch method) used to establish mix proportions.
4. Indicate materials sources for principal constituents.
5. Whether the mix is appropriate for pumping.
6. Evidence of ability of mix to meet requirements for limited shrinkage.
7. Evidence that mix design meets or exceeds the Global Warming Potential minimums listed in Section 2.4.

F. Submit schedule of concrete placement operations before commencing Work, show on one or more plans or elevations, locations of construction, contraction and expansion joints.
1. Contractor's Moisture Emission Control Plan: Provide as required for Project Coordination.

1.4 QUALITY ASSURANCE

A. Comply with the following except where otherwise indicated and where more stringent requirements obtain.
1. ACI 301 Specifications for Structural Concrete for Buildings.
2. ACI 303 Guide to Cast-In-Place Architectural Concrete.
3. ACI 304 Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
4. ACI 305 Hot Weather Concreting.
5. ACI 306 Cold Weather Concreting.
6. ACI 309 Recommended Practice for Consolidation of Concrete.
7. ACI 318 Building Code requirements for Reinforced Concrete.
8. California Building Code (CBC), 2022.

B. Provide an admixture technician for the Work having ACI Level 2 Concrete Technician or other acceptable professional certificate and expert knowledge of the specific products and materials in the mix design including but not limited to admixtures. The technician shall approve each mix design proposed for the Work, assist in proportioning concrete materials for optimal results, and advise on proper admixture use, potential undesirable and uncontrolled effects and propose mix adjustment to meet Project conditions.

1.5 PROJECT CONDITIONS

A. Environmental Requirements: Do not place concrete when weather conditions may reduce performance characteristics, and prevent proper finishing, and curing.

B. Coordinate Schedule and sequence for work of this Section with finish flooring in Sections 09 30 13, 09 65 00, 09 67 00 and 09 68 13 to permit a minimum of 90 days cure while protected

from rain fall and other sources of excess moisture (including moisture generating construction operations) prior to earliest date for beginning of finish floor application.

1. Coordination of measures to prevent excess moisture and alkalinity in concrete slabs, both elevated and non-elevated.

PART 2 - PRODUCTS

2.1 CONCRETE

A. Portland Cement: ASTM C 150, Type II. Use one brand of cement throughout project, unless otherwise acceptable to Architect.

B. Normal Weight Aggregates: From a single source, comply with ASTM C 33, and as herein specified. Do not use aggregates containing deleterious nor alkali reactive substances.

C. Light Weight Aggregates shall conform to C330.

D. Water: Plant-batched concrete shall include a minimum of 6 percent recovered wash-down water measured by volume of total mix. Recovered wash-down water shall be treated by settling, filtration and other acceptable means to remove deleterious materials prior to incorporation into mix.

2.2 ADMIXTURES

A. Subject to compliance with specified requirements, provide one of the listed products for each admixture used; substitution proposals shall comply with requirements of Section 01 33 00.

B. Calcium chloride and admixtures containing more than 0.1 percent calcium chloride ions shall not be used.

C. Coordinate admixtures to ensure compatibility. Prevent unpredictable and noncontrolled side effects and reactions between mix components and provide certification of compatibility signed by Contractor’s admixture technician.

D. Air-Entraining: ASTM C 260.
   1. Darex AEA; GCP Applied Technologies.
   2. MB AE-90; Master Builders.

E. Water Reducer: ASTM C 494, Type A.
   1. Darex WRDA-79; GCP Applied Technologies.
   2. Pozzolith; Master Builders.

F. High Range Water Reducer: ASTM C 494 Type F or G, add at batch plant. Reduce water content 30 to 40 percent, extend plasticity up to 2.5 hours, increase concrete strength at all ages, and maintain, at varying temperature, setting characteristics similar to concrete without admixture.
   1. Rheobuild 1000; Master Builders.

G. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E.
   1. Darex WRDA Type III; GCP Applied Technologies.
   2. Pozzutec 20; Master Builders.

H. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

1. Daratard; GCP Applied Technologies.
2. Pozzolith 300-R; Master Builders.

I. Fly Ash: ASTM C 618 (including Table 2A) Type F or Type C, subject to approval of mix design data.

J. Ground Blast Furnace Slag: ASTM C 989.

2.3 ACCESSORIES

A. Non-Shrink Base Plate Grout: Premixed compound using natural non-metallic aggregate and conforming to Corps of Engineers' CRD-C621-81.
1. Compressive Strength: 2,400 psi in 48 hours and 5,000 psi minimum in 28 days.
2. Five-Star Grout by US Grout Corporation; Masterflow 880 grout by MasterBuilders; or approved.

B. High Strength Non-shrink Grout: Masterflow 928 grout by Master Builders; Sika Grout 212 by Sika Corporation or approved.
1. Fluid Grout: CRD-C611-81, flow of 22 to 30 seconds, one hour after batching, at 40 to 100 degrees F.
2. Strength: 2,500 psi at 24 hours, 4,500 psi at three days, and 7,000 psi at 28 days.

C. Absorptive Cover: Burlap cloth, 9 ounce per sq.yd. complying with AASHTO M 182, Class 2.

D. Moisture-Retaining Cover: Complying with ASTM C 171. Waterproof paper, or polyethylene film.

E. Evaporation Reducer: BASF Confilm, L&M E-CON or approved.

F. Epoxy Adhesive: ASTM C 881 Type, Grade and Class as required. Two component, moisture insensitive, shear bond to concrete of 1400 psi.
1. Subject to conformity to conditions of application and manufacturer's recommended uses the following may be acceptable: Sonnoborne, EpoGel; Master Builders, Brutem MP or Ceilcote 648 CP Plus; Sika, Sikadur 32 Hi-Mod.

G. Patching Mortars:
1. Vertical and non-traffic surfaces: Two-part latex cement and bonding agent suitable for interior and exterior repairs, and feather edge application to 0.0625-inch thickness; Set Latex Cement, Master Builders, or approved. Conventional portland cement mortar and latex additive or bonding agent are not acceptable.
2. Horizontal Trafficked Surfaces: One part (dilute with water) self-leveling, polymer modified industrial topping traffic surface. Repair damaged and rough floors not complying with required tolerances. ChemRex MBT Topping 112.

H. Densifier and Hardener: Comply with Section 03 35 200 and requirements for sealed concrete.

2.4 MIXES

A. Select mix designs based upon the minimum required strengths provided in the General Structural Notes and mixes that demonstrate a reduction in Global Warming Potential (GWP) for the region in units of kgCO2e from manufacturer's baseline mixes.

B. Source mixes within 10 miles of the project site.

C. Mix Design: As specified in ACI 301 for each type of concrete required, use laboratory trial batch or field experience methods.
   1. Mix Design Proposal: Submit in advance of production to avoid delay in Work, do not begin concrete production prior to Architect's review.

D. Standard Mix Characteristics: Comply with General Structural Notes.
   1. Flatwork to receive diamond polish finish shall use only one mix design; use of fly ash in this mix is not acceptable.
      a. Aggregate: 0.375-inch minus.

E. Admixtures: Comply with manufacturer's recommendations for use.
   1. Water Reducer: All concrete, except where high-range water reducer required, reduce water content by at least 12 percent.
   2. Air Entraining: Concrete exposed to weather, and freeze/thaw cycles; percentage required in ACI 301, measured per ASTM C 231 and C 138.
   3. Accelerator: Slabs placed in ambient temperatures below 50 degrees.

F. Transit Mixed Concrete: Conform to ASTM C 94; when air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1.5 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
   1. Do not add water after leaving the concrete plant.

G. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; Acceptable to Architect and at no change in Contract amount.
   1. Submit laboratory test data for revised mix design and strength results for approval before using in work.

2.5 SOURCE QUALITY CONTROL

A. Concrete Testing Service: Engage a Special Inspection and testing laboratory acceptable to Architect to perform material evaluation tests and design concrete mixes as indicated on S0.01 and as otherwise required for the Work.

B. Concrete supplier shall provide a knowledgeable, trained admixture technician and acceptable to the Architect to assist in proportioning concrete materials for optimal results and advise on proper admixture use and mix adjustment to meet Project conditions, at no change in contract amount.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to placing concrete inspect placement of reinforcing, verify that formwork is ready to receive concrete, and that items to be cast-in and embedded are in place. Coordinate the Work of other trades to permit setting and installation of their Work.

3.2 INSTALLATION

A. Placing Concrete: Convey and deposit to ensure a continuous flow at delivery without separation of materials, limit drops to 60 inches for unexposed work and 36 inches for exposed work. Maintain reinforcing in proper position during placing.
   1. In Forms: Horizontal layers up to 24 inches deep, place each layer while preceding layer is still plastic, avoid cold joints between layers.
   2. Slabs: Place and consolidate in a continuous operation to limits of construction joints and to elevation indicated; Surfaces complying with flat and level tolerances requirements and as otherwise necessary for required specified.
      a. Topping Slabs for Composite Deck: Comply with recommendations of deck manufacturer for preparation and placement.

B. Consolidation: During placing by mechanical vibrating equipment, provide even dense surfaces, prevent honeycomb, rock pockets and voids.
   1. Do not use vibrator to transport concrete inside forms. Place at regular intervals within machine's visible effective range.
   2. Rapidly penetrate placed layer and at least 6-inches into preceding layer. Do not insert vibrator into lower layers of concrete that have begun to set.
   3. For exposed concrete keep vibrator on the unexposed side of reinforcing steel, or 2.5 inches away from form surface.

C. Contractor shall apply their best skill and attention to control materials and placement operations to ensure completed concrete slabs are acceptable for applied finish flooring and other finish treatments. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces and referenced Sections of ACI 301.
   1. Flatwork: Provide evaporation retarder throughout grade supported concrete and concrete at composite metal deck in the manufacturer's recommended sequence and application procedure.
   2. Utilize placement method and equipment to ensure compliance with F_F and F_L requirements.
   3. In addition to other means and methods, the following procedures may be representative of effort necessary to produce concrete work complying with specified tolerances.
      a. Following disappearance of bleed water, power float the surface across the width of the strip; following paste generating float passes re-straighten surface with 10-foot highway straight edge applied in two directions at 45-degree angle to strip.
      b. Power Trowel surface with multiple passes and re-straighten by multiple passes with highway straightedge.

D. Cold Weather Placing: Comply with ACI 306 and Section 5 of ACI 301. At ambient temperature below 40-degrees F (4-degrees C), uniformly heat water and aggregates before

mixing, provide a mixture temperature conforming to recommendations of ACI 306. Maintain protection for minimum times recommended in ACI 306.

1. Do not use frozen materials, nor material containing ice. Do not place concrete on frozen subgrade.

E. Hot Weather Placing: Comply with ACI 305. Cool water and aggregates before mixing, maintain concrete temperature at time of placement below 90 degrees F (32 degrees C). Cool reinforcing with wet burlap, keep steel temperature at or below ambient air temperature until embedment in concrete.

1. Use specified water reducer to control concrete temperature rise during adverse placing conditions.

F. Curing: Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Begin final curing immediately following initial curing and before concrete has dried, and continue for seven days. Conform to ACI 308 and the following.

1. Moist Cure: Prevent drying of concrete, keep formwork and concrete continuously wet with water by flooding, fog spray or saturated absorptive cover.
   a. Absorptive Cover: Place contiguously over concrete surfaces in widest widths practical, with edges lapped 4 inches.
2. Moisture Retaining Cover: Place contiguously over concrete surfaces in widest widths practical, with edges lapped 4 inches and sealed with tape. Repair holes as they occur throughout curing period.
3. Monitor the curing operations as required to ensure the concrete surfaces remain fully wetted and that cover materials are not displaced during the full curing period; at a minimum, the curing method shall be checked every 8 hours, including Saturdays, Sundays, and holidays

G. Joints: Make panels and locate joints as indicated. See Section 07 92 00 for joint filler and sealant requirements. Abrasively treat bond surfaces at construction joints, base plates and similar. Clean and roughen the entire bond surface to a 0.25-inch amplitude, exposing coarse aggregate solidly embedded in mortar matrix. Roughen concrete surface while concrete is still green. Remove surface contaminants, laitance, loosened particles of aggregate and friable material.

1. Control Joints: Comply with ACI 301 5.3.5; saw-cut joints between finish and final set operations. Provide joint width of 0.0625 inch. Saw shall have mechanical means for limiting the depth of joint cuts. Properly maintain tools during cutting including changing of blades and anti-ravel skid-plate as required.
2. Construction Joints: Comply with Section 03 11 00 requirements.
3. Edges at Topping Slab Blockout: Where joint is exposed in completed work coordinate joint profile and appearance with requirements of Section 03 35 20.

3.3 FINISHING

A. Formed Surfaces: As specified herein, and as defined in the referenced subsections of ACI 301 Chapter 5, apply at following locations.

1. Formed Finish: 5.3.3.3.a; surfaces concealed by other construction, unless otherwise indicated; 5.3.3.4.a; surfaces with directly applied waterproofing, finish coatings, and coverings.
2. As-Cast, Smooth Form Finish: Work required to remain exposed to view with no additional processing or other applied finish.
3. Finish Processing of As-Cast Work: Working from as-cast smooth-formed surface apply to select components exposed to view in the completed Work.

a. Hand-stoned finish; corners consolidated and finished using a granite rubbing stone or other method per approved mock-up.

4. Adjacent Unformed Surfaces: 5.3.3.5
5. Cure: Moist cure.

B. Concrete designated CONC-5: At cast in place concrete stem walls, site retaining walls and where indicated in Drawings, form for smooth wall finish with reveals as detailed and at designated spacing. Strip formwork at Engineer of Record's earliest allowed interval and provide hand-stoned finish within 24 hours of form removal at surfaces exposed to view in final work.

C. Monolithic and Composite Slabs: As specified herein, and as defined in the referenced subsections of ACI 301 Chapter 5. In general, addition of water on site to ready mix concrete is not acceptable. It is understood that such adjustment to the mix may be desired by the Contractor, the Contractor shall keep accurate record of the specified batch, the quantity of water added and where the concrete was placed, failure to do so may result in rejection of the concrete. Where water is added the Contractor shall be responsible for elevated moisture levels and alkalinity, low strength development and any other defects.

1. Surfaces to receive bonded application of subsequent material including but not limited to paint, ceramic tile, and other finishes or coverings shall have a trowel finish per 5.3.4.2.c and coordinated with work of Division 9 Sections.
   a. When recommended by the manufacture of subsequent applied material provide surface texture with recommended amplitude.
2. Broom Finish: 5.3.4.2.d; provide at exterior traffic surfaces unless otherwise required, provide a 2-inch-wide smooth margin at all perimeter terminations. Coordinate final finish with Architect before application.
3. Slip Resistance of Interior Traffic Surfaces: Compliance with minimum recommendations for specific service environment and flooring type when evaluated per HB 198/AS 4663-2013 test pendulum slip test method.
4. Cure: Contractor option using either moist cure or absorptive cover methods. Provide specified evaporation retarder on all concrete slabs and composite metal deck slabs.

D. Concrete to receive special finishing work of Section 03 35 00 shall be protected from stains due to construction processes, and markings of any kind. Prevent conditions and damage that could alter the appearance of the finished concrete and coordinate with special finishing requirements.

3.4 MISCELLANEOUS CONCRETE ITEMS

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Interior Curbs: Monolithic finish, strip forms while concrete is still green, and steel-trowel to a hard, dense finish, radius corners, intersections and terminations one inch.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as indicated. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

1. Grout base plates and foundations as indicated, using non-shrink base plate grout.

2. Provide high strength non-shrink grout to anchor reinforcing steel, threaded rods, and similar embedded items.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled.

E. Cast-In-Place Stairs: Comply with CBC Section 1009, ANSI 1264.1 and barrier free access requirements of ANSI A117.1
1. Dimensional Uniformity of Stairs: CBC Section 1009.7.
2. Ramps: Comply with CBC Section 1010, ANSI 1264.1, and applicable requirements of stair assemblies for uniformity in the Work.

F. Wash-Down of Concrete Supply Trucks and Related Equipment: Not permitted on Site except where Contractor demonstrates acceptable means for collection and containment of effluent for return to redi-mix plant by supply vehicle.

3.5 TOLERANCES

A. Compliance With Tolerances: Determined once concrete has fully cured, but not sooner than 28 days after placement. Concrete that does not conform to tolerances will be determined to be non-compliant. The Contractor shall correct concrete work to eliminate defects and variations exceeding specified tolerances.
1. General Tolerances: ACI 117 Section 4 except as otherwise required.
2. Conduct survey of supporting formwork and steel prior to concrete placement. Survey points shall be taken at columns and mid-points of bays between columns.
Re-survey at same locations once concrete is placed and hardened. If formwork and/or shoring utilized, conduct surveys prior to removal of formwork/shoring and within 1-day of removal.
3. Report all survey results within two (2) days of survey to design team.

B. On-Grade and Composite Slabs: Levelness requirements do not apply where sloped surface is required. Correct surfaces that do not conform to tolerance limitations by grinding high points and filling low points with approved leveling compound, except as otherwise required for work of Section 03 35 00.
1. Flatness and Level: ACI 117; Flat per Section 4.5.6 and ASTM E 1155.
2. Flatness and Level: F_F 30 and F_L 20 with minimum values not less than F_F 15 and F_L 10; except flatwork to receive diamond polished finish shall have F_F 50 and F_L 30 with minimum values not less than F_F 25 and F_L 15; evaluated per ACI 117 and ASTM E 1155.

C. Coordinate concrete work with requirements for applied finish flooring and other finish treatments. Contractor shall apply their best skill and attention to control materials and placement operations to ensure complete concrete slabs are acceptable for finish floor installation after testing per ASTM F 117 per Section 09 65 00 requirements.

3.6 CONCRETE SURFACE REPAIRS

A. The Contractor is responsible for correction work which does not conform to the specified requirements, including strength, tolerances and finishes. Correct deficient concrete as directed by the Architect.

B. Patching Defective Areas: Repair and patch defective areas with epoxy adhesive and patching mortar; cement mortar may be used only on uncured, green concrete and only when acceptable to Architect. Replace cured, and defective concrete that cannot be repaired to Architect's satisfaction.
   1. Exposed Surfaces: Blend patching mortar to match color and texture of adjacent cured concrete. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Cut out honeycomb, rock pockets, voids over 1/2 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1-inch.
   1. Cut edges perpendicular to concrete surface. Clean patch area, dampen with water, and apply epoxy adhesive. Place patching mortar as recommended by manufacturer of epoxy adhesive.

D. Exposed Formed Surfaces: Repair defective concrete, replace concrete that cannot be repaired to satisfaction of Architect.
   1. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with epoxy adhesive.

E. Concealed Formed Surfaces: Repair defects effecting concrete durability, replace concrete that cannot be repaired to satisfaction of Architect.

F. Repair of Unformed Surfaces: Test slabs for flatness, levelness, and slope to drain.
   1. Repair surfaces containing defects effecting concrete performance including crazing, cracks wider than 0.01-inch cracks that penetrate to reinforcement, cracks that completely penetrate non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable conditions.
   2. Grind high areas after concrete has cured at least 14-days.
   3. Cut-out low areas and replace with fresh concrete during, or immediately after completion of surface finishing operations.

G. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

H. Proprietary patching compounds and repair methods not specified above may be used, subject to acceptance of Architect.

3.7 FIELD QUALITY CONTROL

A. The Owner will employ a testing laboratory to perform tests and to submit test reports.

B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
   1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
   2. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
   3. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air- entrained concrete.
   4. Concrete Temperature: Test hourly when air temperature is 40-degrees F (4-degrees C) and below, and when 80-degrees F (27-degrees C) and above; and each time a set of compression test specimens made.

5. Compression Test Specimen: ASTM C 31; one set of 3 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
6. Compressive Strength Tests: ASTM C 39; one set for each 100-cubic yards or fraction thereof of each concrete class placed in any one day; or for each 5000-square foot of surface area placed; one specimen tested at 7-days, one specimen tested at 28-days, and one specimen retained in reserve for later testing if required.
    a. When total quantity of a given class of concrete is less than 50-cubic yards, strength tests may be waived by Architect if, in his judgment, adequate evidence of satisfactory strength is provided.
    b. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
    c. When strength of field-cured cylinders is less than 85-percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
    d. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive by more than 500 psi.

C. Test results will be reported in writing to Architect and Contractor within 24-hours that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28-days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

E. Additional Tests:
1. The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect.
2. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
3. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.
4. Where initial test for moisture or alkalinity indicate levels not acceptable for application of required finish floor, additional tests shall be made by the Owner's agent at the Contractor's expense, until results demonstrate acceptable levels have been achieved.

F. Field Testing of Walking Surface: Evaluated per ANSI B101.1 and ANSI B101.3; Static and Dynamic Coefficient of Friction not less than 0.42 and 0.35 respectively and comply with referenced NFSI performance characteristics.
1. Testing Incidence: Not fewer than one test specimens for every 500 square feet and as otherwise necessary for a representative sampling per the test methodology
2. Tribometer: Certified per ASTM F 2508

3.8 PROTECTION

A. Protect concrete from premature drying, temperature extremes, and mechanical injury. Comply with Section 5.3.6.4 of ACI 301.

END OF SECTION

SECTION 03 31 13 – SEALED CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes materials, mixes, accessories, and Work necessary and required for cast-in-place concrete as indicated and specified herein.

B. Definitions: Per ACI CT-13 and as follows.
1. Concrete Finishing: Leveling, smoothing, consolidating and otherwise treating surfaces of fresh, recently placed concrete necessary to produce surfaces on both concrete slabs and composite metal deck and concrete complying with the requirements of this Section.
2. Power Trowel: Motor-driven, radial arm, orbiting steel trowel machine used in concrete finishing process to produce a dense and hard surface on concrete slabs that is superior to hand-troweled work.
3. Sealed Concrete: Identifies concrete flatwork to receive specified finish system of potassium silicate surface hardener and burnished sealer.

C. Related Sections
1. 01 81 13.71 Sustainable Design Requirements – CALGreen Non-Residential Mandatory.
2. 03 30 00 Cast in Place Concrete.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards (CALGreen).

B. California Building Code (CBC), International Building Code with California Amendments, California Code of Regulations, Title 24, Part 2.

C. ADA Standards – Americans with Disabilities Act (ADA) Standards for Accessible Design, 2010.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Construction Conference: Held not less than 30 days prior to date scheduled for start of concrete work. Review concrete design mixes, submittals, work schedule and sequence to accommodate required mock-up, construction procedures, schedules for testing, inspection, and certifications. the finish appearance requirements, reveal locations, joint spacing.
1. Coordination for concrete work to remain exposed to view in the completed building including but not limited to as-cast finish concrete and concrete flatwork to receive special finish processes; address formwork, mix design, placement, finishing and curing requirements.
a. Review requirements for preventing marking, staining and damage to concrete substrates and provisions for protection of finished surfaces from subsequent construction activity.

b. Ensure all construction personnel are informed of concrete flatwork to remain exposed as finish flooring in the complete building and exercise necessary care in the conduct of the Work to ensure best possible appearance.

2. Where possible given the schedule and sequence of the Work the applicator for work of sealed concrete shall participate in the conference. Conduct a subsequent, conference to review approved preparation and finish process and field sample.

1.4 SUBMITTALS

A. Product Data: Required for each material and product to be incorporated into the Work.

B. CALGreen Submittals:
1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified.
2. Low VOC / No VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC Emission Limits. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions (gal/L).

C. Provide narrative of work procedures and protection to prevent damage and degradation in appearance of concrete due to construction activities. Coordinate with construction schedule and identify sequence for application of concrete sealer.

D. As directed provide an approved field sample of sealed concrete prior to start of work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers and coatings: Comply with CALGreen limits.

2.2 MATERIALS

A. Concrete Densifier, Hardener and Sealer, Matte Finish: Basis of Design product is Curecrete Ashford Formula; chemically reactive, water-based surface penetrant producing crystalline structure filling concrete surface pores and voids.
1. Densifiers by ProSoCo (Consolideck) and Convergent Technologies (Pentra-Sil) may be acceptable with Architect approval, Reference Section 01 25 00 for Substitution Procedures.
2. Description: colorless, transparent, odorless, non-toxic and non-flammable concrete densifier, hardener and sealer allowing floor traffic within 3 hours, completing final chemically reactive process within 3 months, and developing a burnished concrete surface appearance over time.
a. Provide solvent free, zero VOC product.

B. Concrete Sealer, Gloss Finish: Waterborne concrete sealer producing a glossy, highly abrasion resistant floor finish.
1. Provide Basis of Design product LM Company SCOFIELD SelectSeal Plus, or equal, as approved by Architect. Reference Section 01 25 00 for Substitution Procedures.

2. Description: High-solids, low-odor, self-crosslinking, urethane fortified acrylic sealer manufactured for uncolored and colored interior concrete slab protection.
   a. VOC Content: 100 g/L or less.

C. Repair Underlayment and Overlayment: Cement-based, polymer-modified, self-leveling product applied in 1/8-inch thickness tapering to feathered edge and in 1/8-1/4-inch thickness fill (patch) over scarified surface, respectively.
1. Cement Binder:
2. Primer: As recommended by manufacturer for substrate, conditions and application.
3. Aggregate: Coarse sand; Well-graded, washed gravel, 1/8- ¼ as recommended by manufacturer.
4. Compressive Strength: 28-day compressive strength of 6,000 psi or greater when tested to ASTM C 109.

PART 3 - EXECUTION

3.1 CONCRETE SEALING

A. Clean floor to a roughness average 250 µin evaluated per CSDA Standard 115 Measuring Concrete Micro Surface Texture and as otherwise necessary to remove all evidence of construction wear, stains and soiling.

B. Apply specified solution at a rate approved method to ensure full wetting of surface without perched liquid on the surface or flood coat consistent with product manufacturer's instruction. Gently agitate solution during application to enhance absorption by the concrete where required. Surface shall appear damp or wet for 15 to 20 minutes following application unless otherwise indicated in manufacturer's standard installation instructions or where additional application must be provided.
1. Allow sufficient time for material to cure fully cure before use.

C. Examine floor to identify defects and characteristics that are not acceptable for sealer application; correct all unacceptable conditions as necessary.

D. Refine surface by tool processing to CSDA Standard 115 Surface Texture Grade B-3, Ra 64.

E. Apply specified sealer using pump-sprayer and microfiber mop unless otherwise acceptable. Follow cure mechanically burnish surface using propane driven machine and approved burnishing pads; make multiple passes in opposing directions as necessary to match appearance of approved Field Sample.
1. Slip Resistance of Finished Traffic Surfaces: Performance recognized as high traction and slip resistant by National Floor Safety Institute or other acceptable Standards body when evaluated as required for Field Quality Assurance requirements of this Section.

3.2 REPAIRS

A. Propose repair methods for Architect's review and approval; perform proposed repair testing on approved sample panel to verify patch color and texture match prior to repairing permanent Work. Remove and replace cast-in-place concrete that cannot be repaired and cured to the Architect's approval.

END OF SECTION

SECTION 03 35 20 – SPECIAL FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for finished appearance of cast-in-place concrete slab indicated as SC1 on A-Series sheets and as otherwise required by the Contract Documents.

B. Definitions: As established by the Concrete Polishing Association of America (CPAA).

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Where possible given the schedule and sequence of the Work the applicator for work of this Section shall participate in the conference specified in Section 03 30 00 Cast-In-Place Concrete. The Contractor shall conduct a subsequent, additional conference to review approved Finish Process and mock-up. Identify corrective measure for non-compliant F_F and actions necessary to ensure quality results. Verify temporary controls, and protection are in place or will be available prior to start of work.
   1. Coordinate requirements for treatment of joints, embedded items including but not limited to radiant slab piping and embedded floor boxes, detail finishing and similar related tasks.
      a. Procedure for maintaining level transition across threshold of elevator openings and similar conditions
   2. Confirm work of this Section will be conducted to match the appearance of the approved mock-up at no additional cost to the Owner.
   3. Review requirements for preventing marking, staining and damage to concrete substrates and provisions for protection of finished surfaces from subsequent construction activity.

1.3 SEQUENCE

A. Special Finish on Concrete: Defer application of special finish to limit exposure of finish surfaces to subsequent construction activity. Coordinate construction sequence and finishing work avoid conditions that would restrict access for finishing equipment.
   1. Provide and maintain all necessary protection of processed surfaces to prevent damage, wear and alteration in appearance due to subsequent work activities of any nature. Ineffective and improperly maintain protection will basis for rejection of work and remedial measures necessary to correct unacceptable appearance and conditions.

1.4 SUBMITTALS

A. Product Data: Required for each material and product to be incorporated into the Work.

   1. Certification of Mix Design Review: Finish applicator’s review of the mix design submitted per Section 03 30 00 Cast-In-Place Concrete and all salient information on placement, and cure of concrete flatwork to receive special finish work of this Section.

2. Finishing Equipment: Provide equipment size, weight and intended role in finishing process and demonstrate suitability of specific equipment proposed for the Project giving particular attention to the location, size and configuration of the area to be finished.
3. Walking Surface Test Data: For similarly finished concrete flatwork previously produced by the Contractor's finish applicator demonstrating compliance with coefficient of friction and traction value requirements for work of this Section.

B. Shop Drawings: Indicate locations for field samples, and verification of location where Special Finish is required. Detail areas where hand tools are proposed for application of finish. Indicate control joints to be filled and location of F_F measurements and values associated with each location.

C. Finish Process: Submit written proposal 60 days prior to start of finish work of this Section and prior to mock-up submittal. Detail methods, equipment, personnel, and protective measures proposed for Work. Document process and schedule for each step in application of the required finish.
1. Maintenance Data: Complete information on procedures, equipment and materials necessary for routine maintenance of finished floors and periodic renovation of finish appearance.

D. Protection Plan: Provide a detailed narrative of measures proposed for prevention of wear, damage and alteration in appearance of Special Finished concrete work. The submittal will be reviewed only for compliance with requirements for advance planning of the work. The Architect will not determine the potential effectiveness of the proposed measures in preventing wear, damage and alteration in appearance.

E. Quality Assurance Submittals:
1. Applicator of Special Finish: Certification of qualifications and experience including experience with specific tools and processes proposed for use in this Project.
2. Qualifications of firm performing Micro surface texture measurements and walking surface traction evaluation; document instrument type to be used and calibration certification current as of date of field tests.

1.5 QUALITY ASSURANCE

A. Special Finish Concrete Work: Performed by expert entity having in-depth knowledge of a wide variety of finish methods and equipment suitable for the type of finish in the locations required for the Work. Applicator shall be approved by the manufacturer of the required finishing system and have a successful record of experience with this finish process and the equipment proposed for the Work. Submit documentation for five previous projects including equipment and methods used and the name of the equipment operator(s), complete information on the finishing process and photographic documentation of finishing from original surface to completion.
1. Individual in Responsible Control: For work of this Section have ACI Craftsman Certification as Commercial/Industrial Flatwork Specialist - High Tolerance or CPAA Craftsman Certification; individual shall be on site at all times work is actively in progress.

B. Qualifications of Field Testing Agent for Micro Surface Texture and Walking Surface: CSDA Certification as ST-115 Certified Operator; prior successful experience with ANSI B101.1 and 101.3 and familiarity with test instrumentation and calibration.

C. Special Finish Concrete Mock-up: Provide stepped mock-up and two finished mockups for both grade-supported and composite metal deck slabs. Initial mock-up, nominal 30 square feet as directed on concrete slab on ground floor level and elevated composite metal deck in suitable locations as determined by the Owner and General Contractor. Finish each mock-up using methods proposed in the Finish Process submittal. Provide a separate sample area of a size convenient to show graduated processing: initial step intended to remove imperfections and cement paste from slab surface and expose the sand and concrete matrix but not the coarse aggregate. Where initial mock-up is not acceptable provide subsequent mock-ups to test and validate revisions to finish procedure necessary to produce acceptable results; provide a minimum of four mock-ups at no additional cost to the Owner. Incorporate sample of joint pattern and hand tool finishing as directed. Approved, mock-up shall be maintained to verify acceptability of final work.
   1. Final Finish Surface: Demonstrate level of polish for consistency of appearance to be provided in the final work, and compliance with required clarity, sheen and walking surface requirements.
   2. When directed demonstrate repair techniques on the mock-up. Only approved techniques shall be used in the final work.
   3. Detail Tool Work: Demonstrate uniform appearance and texture match of perimeter and detail areas finished using hand-held tools and other specialized means and equipment to primary floor areas.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Special Finished Concrete (PCI): Produced through a controlled incremental process. Generally subtractive processes are anticipated utilizing various methods and items of equipment appropriate for the work required and characterized as grinding by wet and dry processes and subsequent polishing. Either or both steps may require multiple grades of abrasive media, specialized tools and other work as established by the approved mock-up. The various steps, processes, means methods and equipment necessary to achieve the required finish are not limited by this Section; final determination of these shall be the responsibility of the Special Finish applicator as necessary to achieve the finish appearance specified herein and represented by approved submittals at no additional cost to the Owner.
   1. Initial grinding as determined necessary based on the average roughness, Ra determined in accordance with CSDA -ST-115 to produce the required finish surface and appearance, adapt process to multiple grindings with different grit and as otherwise necessary due to floor flatness, requirements for limited aggregate exposure and uniformity of appearance in finish surface.
      a. Filling Compound: In conjunction with initial grinding process provide regrouting and filling treatment with floor grinding per the manufacturer's recommended procedure. Provide corrective and remedial measures for cracks, voids and similar characteristics.
      b. Control Joints: Provide manufacturer's recommended traffic bearing filler suitable for required finish and complying with appearance requirements. Provide detail treatment and finish control joints and all other joint types present in the work.
   2. Chemical Treatment: Penetrating zero VOC calcium hydroxide reacting potassium-silicate treatment to harden and densify concrete surfaces by the formation of calcium silicate; provide multiple applications as necessary due to specific characteristics of the slab to be finished.

3. Mechanical Polishing of Hardener-Densifier: Using resin-bonded diamond pads remove scratch marks from previous polishing with metal bond pads and as necessary to fully activate the surface hardener-densifier chemical treatment and remove surplus residue.
   a. Adjust abrasive grit of pads and provide multiple grindings as necessary due to specific Project conditions and to ensure complete removal of surplus chemical treatment.
4. Mechanical Finish Polishing: Provide a minimum of four steps using graduated abrasive pads of resin bonded diamonds to achieve the required Surface Refinement.
5. Finishing Treatment: Soil and stain resisting penetrating surface impregnator; apply multiples coatings, but in no case less than two, as demonstrated to achieve acceptable finish appearance in approved submittals. Buff surface once material has fully cured per manufacturer's recommendations. Acceptable finish appearance may be achieved by providing the following surface characteristics.
   a. Reflective Clarity: ASTM D 5767, not less than 70.
   b. Reflective Sheen (Gloss): ASTM D 523 not less than 35.
6. Appearance of Finished Work: Provide uniform characteristics including but not limited to depth of removal of cement paste, degree of concrete matrix exposure, corresponding to CSDA ST-115 level 2 Sand Finish, and Surface Texture Grade A-3, gloss, slip resistance and all other aspects of appearance in the finished work.
   a. Provide corrective and remedial measures for cracks, voids and similar characteristics.
   b. Provide detail treatment and finish control joints and all other joint types present in the work.
   c. Provide remedial measures necessary to correct surfaces that exceeds F_F required for the Work
7. Slip Resistance of Finished Traffic Surfaces: Performance recognized as high-traction and slip resistant by National Floor Safety Institute or other acceptable Standards body when evaluated as required for Field Quality Assurance requirements of this Section.
8. Pass ANSI A137.1 Section 9.6 Dynamic Coefficient of Friction AcuTest and as otherwise necessary for compliance with barrier free access requirements.
9. Protection of Processed Concrete: Prevent wear, damage and alteration in appearance due to contact with oils, solvents, caustic substances and other materials utilized in the Work. Maintain areas routinely collect and dispose of dirt, debris, surplus materials, and other potential contaminants. Provide combination of sheet materials, traffic surfacing, padding and other protection as necessary for work activities and Project Schedule during and subsequent to the work of this Section.

2.2 MATERIALS

A. Products, Admixtures, Mix Design and Related Work: Per Section 03 30 00 Cast-In-Place Concrete and as otherwise required for work of this Section.

B. Special Finish System: Provide products of Husqvarna HiPER Floor system and associated equipment and consumables as necessary for required finish flooring system as demonstrated in approved submittals.
   1. Regrouting and Filling Treatment: Husqvarna GM 3000.
   2. Dustproof and Hardener: Zero VOC, chemically reactive liquid potassium-silicate Husqvarna Hiperhard.
   3. Finish Treatment: Husqvarna Hiperguard Premium Enhance sealer.
   4. Provide joint filler and all other accessory materials per the manufacturer's recommendations for the required finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to starting work verify the following with work of Section 03 30 00 and provide corrective actions where necessary to comply with requirements of this Section.
   1. Identify F_F values of slab in each area where diamond polish finish is required and verify compliance with requirements in Section 03 30 00. Correct areas that deviate beyond specified tolerance until they are brought into compliance.
   2. Inspect flatwork to receive special finishing for stains, markings and conditions that alter or impair appearance of finished work. Identify unacceptable conditions for corrective action prior to start of special finishing work.

B. Joints: Coordinate joint location and installation with work of Section 03 30 00; provide for joint treatments as work of this Section.
   1. Provide filler matching appearance and characteristics of adjacent work where an open joint would be subject to damage due to finish application or subsequent traffic exposure.
      a. Provide detail treatment and finish control joints and all other joint types present in the work.

C. Fill cracks. correct unacceptable characteristics, damage and imperfections using products recommended by the applicator based on their prior successful experience, and per approved submittals.
   1. Block-outs: Coordinate with Section 03 11 00 and requirements for the work.

3.2 FINISH APPLICATION

A. Placement, curing, and initial finishing of concrete flatwork shall comply with Section 03 30 00 Cast-In-Place Concrete.

B. Perform finishing operations in as continuous an operation as possible. Provide uniform appearance throughout the finished Work.
   1. Provide uniform appearance across joints acceptable to Owner’s Representative.
   2. Use detail tools and other approved methods to achieve uniform finish appearance in areas not accessible to larger equipment; locations include but are not limited to perimeter walls, corners, stair treads and risers, and stair plinths, treads and risers. There shall be no visible difference between

C. Special Finish for Concrete Flatwork: Provide for cast-in-place concrete flatwork Scheduled as Coordinated with Finish Schedule designations. Per the approved finish process and as demonstrated in approved mock-up and other submittals as providing an acceptable match to the record control sample.
   1. Finishing process shall include application of surface hardener and densifier in the sequence and method determined by the applicator and per the manufacturer's recommended best practices for specific Project circumstances.
   2. Control work sequence and provide all temporary measures and controls necessary to replicate the appearance of the approved mock-up and match the record control sample.
   3. Surface Refinement: Incremental tool processing of concrete flatwork complying with CSDA Standard 115.
      a. Surface Texture Grade A-3, Ra 8 µin.
      b. Level 2 Sand Finish.

4. When necessary due to Project conditions or other considerations propose revisions to the Finish Process for review. Revisions to the Finish Process shall be provided at no additional cost to the Owner.

D. Coordinate subsequent work to ensure finished concrete is free from damage and deterioration at Substantial Completion.

3.3 FIELD QUALITY REPORT

A. Provide measuring and evaluation of concrete micro surface texture in accordance with CSDA-ST-115 Measuring Concrete Micro Surface Texture as work of this Section
1. Flatness and Level: F_F 50 and F_L 30 with minimum values not less than F_F 25 and F_L 15; evaluated per ACI 117 and ASTM E 1155.
2. Reflective Clarity and Gloss: Evaluate per ASTM D 5767 and ASTM D 523 following surface refinement and prior to additional work including but not limited to sealer application.

B. Field Testing of Walking Surface
1. Evaluated per ASTM E 303 or as modified for the British Pendulum Tester or AS/NZS 4586.
a. Testing Incidence: Not fewer than one test specimens for every 1000 square feet and as otherwise necessary for a representative sampling per the test methodology
b. Tribometer: Certified per ASTM F 2508

C. Review recommendation of the manufacturer of the specified Finish System materials for the finish floors including products, procedures and frequency.

END OF SECTION

SECTION 03 35 46 – VAPOR EMISSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for treatment of newly placed concrete flatwork to prevent vapor emission and elevated pH.
   1. Unless otherwise acceptable to the Design-Builder vapor emission control specified in this Section shall be performed as work of Section 03 30 00 for cast-in-place concrete.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Construction Conference: Coordinate with Pre-construction Conference requirements of Section 03 30 00 Article 1.5 paragraph H.
   1. Work Sequence: Timing for application of vapor emission control treatment and coordination with concrete finishing procedures and final curing of concrete.
      a. Concrete Curing: Review curing method and work sequence for coordination with vapor emission control application.
      b. Control Joints: Coordinate placement sequence with application of vapor emission control; unless otherwise acceptable place control joints prior to treatment application.
   2. Review annotated placement plan for all areas where vapor emission control treatment is required.
   3. Grade-Supported Slabs: Verify compliance with ASTM F710 as necessary for work to qualify with the required vapor emission control warranty.

1.3 SUBMITTALS

A. Product Data: Required for each material and product to be incorporated into the Work.

B. Annotated Placement Plan: Coordinate with work of Section 03 30 00 diagram placement areas and sequence for concrete flatwork and clearly indicate all portions required to receive vapor emission control treatment. Coordinate work sequence and timing with other concrete work including but not limited to finishing and curing to ensure efficient and timely progress of the work.

C. Preparation of Treated Concrete to Receive Applied Finish Floor Covering: Provide the Design-Builder with recommendation of the treatment manufacturer for procedures and products to be used to prepare concrete for finish floor application. Include without limitation recommendations for sealing of cracks, joints, abraded areas and other conditions that may void the specified Warranty or otherwise compromise vapor emission control performance.

1.4 SPECIAL WARRANTY

A. Vapor Emission Control: Provide manufacturer’s warranty against failure of treated concrete flatwork to prevent vapor emission and elevated pH in accordance with the manufacturer’s representations for a period of 15 years.

1. Perform work of this Section to ensure compliance with precedential conditions required for warranty coverage.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Vapor Emission Control Treatment: Basis of design is OBEX Creteseal CS200.
   1. Provide equipment and consumables as necessary and as otherwise recommended by the manufacturer for application of vapor emission control treatment.
   2. Provide ancillary material and equipment as necessary for coordination with concrete work of Section 03 30 00 and to otherwise prevent delay to the Schedule.

B. Subject to conformance with project requirements, vapor emission control products manufactured by Koster American Corp and Ardex Americas may be acceptable, with Architect approval per Section 01 25 00 requirements.

PART 3 - EXECUTION

3.1 VAPOR EMISSION CONTROL TREATMENT

A. Using means and methods and sequence recommended by the manufacturer and as coordinated with concrete work of Section 03 30 00 provide spray application at the recommended coverage rate for all areas receiving applied finish floor coverings indicated on Floor Finish Plans.

B. Coordinate concrete curing and other work requirements to be performed subsequent to vapor emission treatment application with requirements of Section 03 30 00.

END OF SECTION

SECTION 03 37 13 - SHOTCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Construction: Provide material, labor, equipment, services, test panels, tests and inspections necessary for the installation of shotcrete work. The work also includes the following:
   1. Installation of inserts, sleeves, dowels, anchor bolts and other items embedded in shotcrete, but furnished under other sections.

B. Engineering: Provide engineering services for the design and implementation of shotcrete mix designs.

C. Shotcrete may be used only where specifically noted on the Drawings. Where shotcrete may be used, it is the Contractor's responsibility to confirm which work, if any, is appropriate to be placed with shotcrete.

1.2 RELATED INFORMATION AND REQUIREMENTS

A. Drawings and general provisions of the Contract, including general conditions and Division 1 Specification Sections, specific Specification Sections listed below, and all other Specification Sections apply to this Section.
   1. Concrete Forming
   2. Concrete Reinforcing
   3. Cast-In-Place Concrete

1.3 DEFINITIONS

A. Shotcrete: Mortar or concrete pneumatically projected onto a surface at high velocity.

B. Dry-Mix Shotcrete: Shotcrete with most of the mixing water added at the nozzle.

C. Wet-Mix Shotcrete: Shotcrete with ingredients, including mixing water, mixed before introduction into delivery hose.

1.4 PREINSTALLATION MEETINGS

A. Review methods and procedures related to shotcrete, including but not limited to, the following:
   1. Qualification data, equipment, and facilities needed to advance work without delay.
   2. Shotvcrete finishes and finishing.
   3. Cold and hot weather shotcreting procedures.
   4. Construction joints.
   5. Forms and form-removal limitations.
   6. Reinforcement accessory installation.
   7. Shotcrete repair procedures.
   8. Protection of shotcrete.

B. Before submitting design mixtures, review each shotcrete design mixture and examine procedures for ensuring quality of shotcrete materials.

1.5 REFERENCE DOCUMENTS

A. Standards: Comply with the provisions of the documents listed below and with the requirements described in this Section. Use current editions of documents unless earlier editions are specifically referenced by the governing code or are otherwise indicated.
   1. CBC – 2022 California Building Standards Code.
   2. ACI - American Concrete Institute, Manual of Concrete Practice, including, but not limited to, the following sections:
      a. ACI 301 "Specification for Structural Concrete for Buildings".
      b. ACI 304R "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".
      c. ACI 506R "Guide to Shotcrete".
      d. ACI 506.2 "Specification for Materials, Proportioning, and Application of Shotcrete."
   3. ASTM, American Society for Testing and Materials, designations referenced herein.

1.6 SUBMITTALS

A. General: Submittals shall be sent to the Architect, or Owner's Testing Agency, or both, as required herein for review prior to commencing the work. Review of submittals covers the general character of the details and to verify compliance with the performance requirements. Review does not cover checking of quantities, proportions or dimensions. Such review shall not relieve the Contractor from responsibility for executing the work in accordance with the Contract Documents.

B. Procedures: The Contractor shall submit a description of the shotcrete process proposed for use for review by the Architect and Owner's Testing Agency. The description shall include all proposed deviations from provisions of ACI 506R and ACI 506.2, requirements of these Specifications, and provisions of other specified reference specifications or standards.

C. Shop Drawings: The Contractor shall prepare and submit shop drawings to the Architect showing:
   1. Joints: Indicate details and locations of construction, control, and expansion joints.
   2. Penetrations and Openings: Indicate locations and sizes of penetrations in shotcrete members.
   3. Placing Sequence: The Contractor shall submit a proposed sequence for placing shotcrete to the Architect for review before commencing with the work. The sequence shall include the locations, extents, and structural members included in each placement as well as which side of the structural member has formwork.

D. Product Data and Certificates of Compliance: The Contractor shall submit manufacturer's data and certificates of compliance for each product to the Architect for review.

E. Qualifications: Contractor shall submit qualifications to the Architect and Owner's Testing Agency as follows:
   1. Shotcrete Foreman: Submit evidence of the following:
      a. Licensed to perform shotcrete work in the State of Oregon.
      b. Minimum of five years of experience of similar responsibility on other shotcrete projects of similar scope.
   2. Shotcrete Operator: Submit evidence of the following:

a. Licensed to perform shotcrete work in the State of Oregon.
b. Minimum of five years of experience successfully placing shotcrete on projects of similar scope.

F. Test Panels: Prepare preconstruction test panels at least 21 days prior to job placement, using the mix and equipment proposed for the project.
1. Each proposed nozzleman shall prepare a minimum 3 foot by 3 foot test panel demonstrating each shooting orientation for each shotcrete class.
2. Fabricate test panels in accordance with ASTM C1140 and CBC 1908.10 and as approved by the Architect.
3. The formwork shall be as specified and the reinforcing steel shall represent the most congested condition proposed for shotcrete. Specified curing and finishing measures for the concrete class shall be utilized.
4. Notify Owner's Testing Agency to observe placement of panels. Maintain panels at point of fabrication for 7 days and until Owner's Testing Agency has taken cores.
5. In the event of failure, nozzlemen shall be permitted one retest. Any nozzleman failing the second test shall not be permitted on the project.
6. Test panels will be removed from the site after acceptance of shotcrete work.

G. Architectural sample panels: Provide sample panels as specified in section titled "Cast-in-place Concrete".

H. Architectural mock-up: Provide one concrete mock-up as specified in section titled "Cast-in-place Concrete". One of the required test panels may also be used as the Architectural mock-up.

I. Mix Design: The Contractor shall submit shotcrete mix designs for review by the Architect and Owner's Testing Agency at least seven days before placing concrete. Review of mix designs covers general conformance with the specifications but does not constitute an approval of the mix proportions. Submit one mix design for each class of concrete. Each mix design shall include the following information:
1. Concrete class,
2. Member types and specific placement locations,
3. Material quantities per cubic yard,
4. Material ingredient certificates of compliance,
5. Coarse and fine aggregate sources, types, sizes, and gradation,
6. Admixture product data and dosage,
7. Design compressive strength, age (in days) required to reach design compressive strength, and compressive strength historic data,
8. Maximum water to cementitious materials ratio,
9. Unit weight of freshly mixed and oven-dry concrete,
10. Calculated percent water-soluble chloride ions (Cl^-) by weight of cement, considering the chloride ion content of all concrete ingredients,
11. Water-soluble chloride ion content historic data or trial batch test data, when required herein,
12. Contractor's Engineer's stamp and signature certifying that the concrete mix has been designed under the supervision of the Contractor's Engineer.

J. Contractor's quality control test and inspection reports: The Contractor shall submit quality control test and inspection reports to the Architect and Owner's Testing Agency for review.

1.7 TESTS AND INSPECTIONS

A. Notification:
1. The Contractor shall notify the Owner's Testing Agency of work to be tested and inspected. Notification shall be sufficiently in advance to allow scheduling of tests and inspections, but not less than 24 hours.
2. The Contractor shall immediately notify the Architect if the Owner's Testing Agency indicates that quality assurance tests and inspection requirements have not been met.
3. The Contractor shall notify the Architect 48 hours prior to placing shotcrete to facilitate structural observation.

B. Owner's Quality Assurance Tests and Inspections:
1. General: Quality assurance tests and inspections shall be the responsibility of the Owner. The Owner shall retain a testing agency, referred to herein as the Owner's Testing Agency, who shall perform the required tests and inspections, prepare written summary reports of tests and inspections, and review submittals.
2. Code Required Tests and Inspections: The Owner's Testing Agency shall perform tests and inspections in compliance with the CBC (1908.10) except where more restrictive requirements are specified herein.
3. Test Panel Tests and Inspections: Owner's Testing Agency shall provide full time inspection of the placement and construction of the test panels.
   a. Take six cores from each panel, three with reinforcement and three non-reinforced.
   b. Visually inspect and grade cores with reinforcement in accordance with Section 1.7 of ACI 506.2, "Shotcrete Core Grades". Samples taken from each test panel shall achieve a mean core grade of 2.0. No single core shall have a core grade exceeding 3.0
   c. Test panel shall be sawcut or broken at the discretion of the Owner's Testing Agency when required to determine the soundness and uniformity of the panel.
   d. Test non-reinforced cores for compressive strength at 7 days in accordance with ASTM C 42.
   e. The mock-up panel report is subject to the review and approval of the Architect.
4. Pre-Placement Inspection: Shotcrete shall not be placed until the screeds and reinforcement have been reviewed by the Owner's Testing Agency.
5. Job Site Special Inspections: The Owner's Testing Agency shall provide the following special inspections during the project construction:
   a. Special inspection of shotcrete placement as per CBC Chapter 17 is required. The special inspector shall check the materials, placing equipment, details of construction and construction procedure. The inspector shall furnish a verified report, based on personal knowledge, that the work has been performed, and materials used, and installed in accordance with, and in conformity to, the approved Drawings and Specifications.
   b. Special inspection of location of embedded items and anchor bolts and anchor rods.
6. Job Site Tests: Perform the following tests not less than once each shift nor less than once for each 50 cubic yards of shotcrete placed through the nozzle:
   a. Density, yield, and air content: ASTM C 138.
   b. Temperature: ASTM C 1064.
7. Collection of Test Cores: During the progress of the shotcrete work a set of three 3-inch minimum diameter cores shall be taken not less than once each shift nor less than once for each 50 cubic yards of shotcrete placed through the nozzle.
   a. Cores shall be taken and tested either from the structure, if approved by the Architect, or from separately gunned test panels in accordance with ASTM C 42

and ACI 506.2. If test panels are used, they shall be constructed in accordance with ASTM C 1140.

b. Cores shall be taken at least 14 days after shotcrete is placed. Core holes taken from the structure shall be plugged immediately after inspection of holes by special inspector. Do not cut steel reinforcement.

c. Prior to testing, cores shall be taken to the Owner's Testing Agency and soaked in water for a minimum period of 24 hours.

8. Laboratory Tests of Test Cores: Cores shall be tested in accordance with ASTM C 42 and the average compressive strength of each set of 3 cores taken from the structure or test panels must equal or exceed 0.85 f'_c* with no individual core in the set testing below 0.75f'_c*.

f'_c* = specified minimum 28-day compressive strength

a. Should the compressive strength of the test cores be less than the specified compressive strength, the shotcrete represented by the cores shall be considered defective work. The extent of the defective work shall be determined by the Architect.

C. Contractor's Quality Control Tests and Inspections:

1. General:

a. Quality control tests and inspections shall be the responsibility of the Contractor.

b. Where required herein, the Contractor shall demonstrate that quality control conforms to the requirements of the Contract Documents.

c. Quality Control Test and Inspection Reports shall be prepared and submitted for review.

2. Concrete Mix Trial Batching: Where required herein, the Contractor shall prepare shotcrete trial batches in accordance with ASTM C 192 as needed for preparation of test specimens. The number of batches and quantity of each batch shall be at least adequate to prepare the required number of test specimens for each of the required tests as follows. Test specimens for different tests may be taken from a single batch.

a. Compressive test specimens: Trial batch and test specimen quantity shall be in conformance with the requirements of the governing building code.

1.8 CONTRACTOR'S ENGINEERING SERVICES

A. General: Where engineering services are required herein, the Contractor shall retain either a Civil or Structural Engineer registered in the State of Oregon, referred to herein as the Contractor's Engineer.

1. Documents prepared by the Contractor's Engineer shall be stamped and signed.

B. Shotcrete mix designs shall be prepared, signed, and stamped by the Contractor's Engineer certifying that the mix design has been prepared under supervision and that the mix designs meet the requirements of the Contract Documents.

C. Temporary supports required for shotcrete test panels, sample panels, and/or mock-ups shall be designed by the Contractor's Engineer.

PART 2 - PRODUCTS

2.1 SHOTCRETE MATERIALS

A. Concrete materials shall conform to applicable requirements of Section Titled, “Cast-in-Place Concrete,” ACI 506R and ACI 506.2, except as otherwise specified herein.
   1. Aggregates:
      a. General: ASTM C 33 except as otherwise specified.
      b. Coarse Aggregates: ½” maximum crushed stone. Comply with gradation No. 3 requirements from ACI 506R.

2.2 SHOTCRETE EQUIPMENT

A. General: Equipment shall conform with the requirements of ACI 506R.

B. Mixing Equipment: Capable of thoroughly mixing shotcrete materials in sufficient quantities to maintain continuous placement.

C. Delivery Equipment: Capable of discharging shotcrete material mixture accurately, uniformly, and continuously.

2.3 SHOTCRETE MIX DESIGNS

A. General:
   1. Shotcrete mix designs shall be designed and documented by the Contractor’s Engineer.
   2. The Contractor shall review proposed shotcrete mix designs for compatibility with the intended placement requirements to ensure that the shotcrete, as designed, can be placed in accordance with the Contract Documents.
   3. The proportions of the shotcrete mixes shall be such as to produce shotcrete for each class of shotcrete that conforms to the specified minimum compressive strength, within the specified maximum water-cementitious materials ratio.
   4. Determination of the amount of water in the batch shall include water contained in the aggregates.
   5. The proportion of materials shall be accurately controlled so as to produce thorough & uniform hydration of the shotcrete which when shot will form a homogeneous mass containing neither sags nor dry sand formations.
   6. Architectural shotcrete shall be supplied, produced, and delivered from a single source.

B. Shotcrete Mix Requirements:
   1. Air content: Use of air entrainment admixtures shall not be permitted.
   2. Unit weight: Wet and dry unit weight shall be calculated in conformance with ASTM C 138 and ASTM C 567, respectively. Maximum unit dry weight shall be between 147 and 153 pounds per cubic foot (pcf).
   3. Shotcrete mixes shall be designed in accordance with the following requirements:

SHOTCRETE MIX REQUIREMENTS				
Concrete Class	Concrete Elements	Performance Criteria	Limiting Parameters	Additional Notes
		Minimum Compressive Strength (psi) (Note 2)	Maximum Water to Cementitious Materials Ratio (W / CM) (Note 3)	
A	Building Walls	5,000	0.45	4
B	Retaining Walls	4,000	0.45	4

Notes:

1. N/A stands for “not applicable”.
2. Based on 28-day minimum compressive strength. When 56-day minimum compressive strength is used, minimum 28-day compressive strength shall be 80% of required minimum 56-day compressive strength.
3. W = weight of water. CM = weight of cementitious materials (cement plus fly ash or ground blast furnace slag).
4. The mix design submittal for this class of shotcrete shall include evidence that the proposed mix meets each of the required performance criteria listed above through trial batch test data or historic data for the exact mix to be used on this project.

PART 3 - EXECUTION

3.1 PROTECTION OF MATERIALS

A. Protect materials from damage, weather, and contaminants such as grease, oil, and dirt.

3.2 PREPARATION

A. General: Before any shotcrete is placed, the Contractor shall ascertain that all reinforcing steel has been installed and blocked from the formed surface, and that all fittings, anchors, inserts, etc., to be embedded in the shotcrete have been placed as specified. The Contractor shall be responsible for maintaining the alignment of all work embedded in the shotcrete during its installation.

B. Preparation of Surfaces to Receive Shotcrete: Clean reinforcement of loose mill scale, rust, oil and other substances which will interfere with bond, in accordance with ACI 506R. Sandblast concrete, masonry or steel to which new shotcrete will be applied. Just before application, clean sandblast residue from surfaces. Keep concrete and masonry surfaces damp for several hours before application.

C. Reinforcing Steel: Comply with the requirements of CBC Section 1908.4 for reinforcing steel placement unless satisfactory shotcrete placement with the test panel demonstrates that deviations may be accepted. The Contractor shall propose revisions to the reinforcing steel layout shown on the drawings where appropriate to meet the requirements of CBC Section 1908.4 or to facilitate shotcrete placement.

D. Protection: Protect walls, floors, equipment and other items from damage by dust, rebound and water. Promptly clean all items contacted by dust or rebound by scraping, brushing or washing as surfaces permit.

E. Alignment Wires: Install 20-gage hard steel piano wire for alignment wires (horizontally and vertically) at corners and offsets not clearly established by forms, at exterior corners of walls, columns, beams, and other locations. Alignment wires may be used as screed guides. Alignment wires shall be tight, true to line, and placed so they may be further tightened.

3.3 PLACING

A. General: Place all shotcrete in accordance with the provisions of ACI 506.2. Do not place shotcrete unless in presence of special shotcrete inspector. Do not permit premixed material which stands more than 45 minutes to get to nozzle.

B. Gunning: Build up each layer of shotcrete with several passes of nozzle. Except when enclosing reinforcing steel, the nozzle shall be held at right angles to the surface to be shotcreted and at a distance from 2-1/2 to 3 ft. When enclosing reinforcing steel, the nozzle shall be held so as to direct the material behind the bars. Each side of each bar shall be shot separately. Application to walls shall begin at the bottom. Direct intermittent flowing shotcrete away from work until flow again becomes constant. Completely encase reinforcement with sound shotcrete. Thickness of layer, when gunning walls, is thickness at which shotcrete does not sag. Keep top surface of thick layers at about 45 degree slope. Any deposits of loose sand or rebound shall be removed from surfaces before shotcreting. A second experienced nozzleman equipped with an air jet shall attend the operators whenever reinforcing steel is being enclosed and shall precede the nozzle and blow out all rebound and sand which may have lodged behind the steel.

C. Preparation for Succeeding Layers: Allow preceding layer to take initial set. Remove laitance, loose material and rebound by brooming; remove laitance which has taken final set by sandblasting, then clean surface with air water jet. Cut out rebound pockets, unbonded areas, sags and other defects; replace with new shotcrete. Apply succeeding layer to dampened preceding layer.

D. Rebound: Keep rebound out of work. Do not use rebound; remove rebound from site daily.

E. Construction Joints: Slope shotcrete surface to shallow edge form (1” thick board laid flat). Do not use square construction joints except where noted on the Drawings. Remove rebound trapped at joints. Thoroughly clean and wet entire joint prior to application of additional shotcrete

F. Hot Weather Placing: During hot weather, mix, place, and protect shotcrete according to ACI 506.2.

G. Cold Weather Placing: During cold weather, mix, place, and protect shotcrete according to ACI 506.2.

3.4 FINISHING

A. See 03 30 00 Cas-in-Place Concrete.

3.5 CURING

A. See 03 30 00 Cas-in-Place Concrete.

3.6 PROTECTION

A. Protect shotcrete from damage from construction and weather.

B. Contact with shotcrete shall be avoided for at least 24 hours after placing.

C. Protect shotcrete during and after curing from damage during subsequent construction operations.

D. Shotcrete shall not be subjected to loads unless those loads are resisted directly by shoring until shotcrete has attained its specified compressive strength (14 day minimum) and until curing operations have been completed.

3.7 ACCEPTANCE CRITERIA

A. Shotcrete shall meet the following acceptance criteria:
1. Shotcrete shall conform to the established tolerances.
2. Shotcrete shall meet the established performance criteria.
3. Shotcrete shall be free from voids, rock pockets, cracks, pour joints, spalls, honeycombs, and air bubbles that adversely affect the structural adequacy.

B. Architectural shotcrete, in addition to the requirements above shall meet the additional criteria:
1. Architectural shotcrete shall be free from defects affecting color, texture, fins, voids, rock pockets, cracks, pour joints, spalls, honeycombs, and air bubbles that, in the opinion of the Architect, affect the appearance of the shotcrete.

3.8 CORRECTION OF DEFECTIVE WORK

A. Correction of defective work shall be the responsibility of the Contractor.

B. Work not in compliance with the requirements of the Contract Documents shall be considered defective, unless otherwise directed in writing by the Architect.

C. Corrected work shall conform to the requirements of the Contract Documents.

D. The Contractor shall prepare a submittal documenting the defective work and proposed corrections and submit to the Architect for review. The submittal shall include a description of the defective work, the location of defective work, and shall be accompanied by supporting sketches, photographs, or both. Additionally, the submittal shall include similar documentation of the Contractor’s proposed corrections.

E. Correction of defective work shall not commence until the Architect has reviewed and accepted the submittal.

F. Correction of defective work shall be inspected by the Owner’s Testing Agency.

3.9 CLEAN-UP

A. Remove from the site all debris resulting from the work of this Section.

END OF SECTION

SECTION 03 48 19 - PRECAST CONCRETE STAIR TREADS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Precast concrete stair treads, risers and landings, anchored to supports on steel stairs.

B. Related Sections:

   1. Section 05 51 00 Architectural Metal Stairs: Stairs and stringers designed, fabricated and installed to meet applicable building codes, including weld plates for field attachment.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM C33 Concrete Aggregates
   2. ASTM C139 Concrete Compressive Strength
   3. ASTM C 144 Aggregate for Masonry Mortar
   4. ASTM C 150 Portland cement
   5. ASTM C595 Standard Specification for Blended Hydraulic Cements
   6. ASTM C 642 Water Absorption, Density, Voids in Hardened Conc
   7. ASTM C 666 Rapid Freeze/Thaw Resistance of Conc
   8. ASTM C 979 Pigments for Integrally Colored Concrete
   9. ASTM C 1028 Coefficient of Friction

1.3 SUBMITTALS

A. Shop Drawings: Unit identification, dimensions, cross-section, and fabrication tolerances; Location, size, and type of reinforcement, joints, lift and support points, and components to connect precast concrete work to the primary structure; narrative of erection procedure.
   1. Provide setting drawings and templates showing recommended installation of anchorage devices.

B. Samples: Prior to starting fabrication of final work, submit two 12” wide by full depth samples of each type of stair tread unit and landing plank in profile and configuration indicated, demonstrating the full range of precast concrete color, surface variation and final finish texture required for exposed surfaces and including integral detectable warning stripes, for selection and approval.
   1. Apply sealer to one sample.

C. Manufacturer's Installation Details: Submit complete.

D. Warranty: Provide certified copies of manufacturer's product warranties.

1.4 SUBSTITUTIONS

A. Refer to Section Division 01 for Product Substitution requirements and procedures.

1.5 QUALITY ASSURANCE

A. Compliance with Regulations: Comply with requirements of state and local building codes and with rules and regulations relating to building accessibility.

B. Qualifications of Manufacturer: Company specializing in manufacture of precast concrete stair treads with a minimum of 10 continuous years of documented experience.

C. Treads and connection shall be capable of supporting dead loads plus a uniform live load of 100 pounds per square foot.

D. Erector Qualifications: PCI Certified Erector for Category A-Architectural Systems with 5 years successful experience with erection of precast concrete stair assemblies similar in complexity and scale to the Work; alternative means of demonstrating qualifications for control of appearance in the work including but not limited to work samples may be acceptable as required for Substitutions.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials to the installation site in the manufacturer's original packaging. Packaging shall contain manufacturer's name, customer name, order, identification number, and other related information.

B. Handle and store stair treads, risers and landings in accordance with manufacturer's recommendations:
   1. Store units at project site to prevent cracking, distortion, warping, staining, and physical damage and so that markings are visible.
   2. Lift and support units only at designated lifting or supporting points shown on final shop drawings.

C. Deliver loose connection hardware to be attached to other construction before start of such Work.
   1. Provide templates, setting diagrams, and instructions as necessary for proper installation of loose hardware.
   2. Coordinate with other trades for installation of items cast into Work.

1.7 WARRANTY

A. Provide warranty covering precast concrete stair treads, risers and landings against defects in material and workmanship for a period of 5 years. Unusual abuse and neglect are excepted.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design products as manufactured by Stepstone, Inc., 17025 South Main Street, Gardena, CA 90248; (310) 327-7474; www.stepstoneinc.com.

2.2 MATERIALS

A. Subject to conformance with requirements, provide CalArc "Steptreads", precast concrete, consisting of Portland cement, aggregate, color admixtures, and reinforcing, factory formed to profiles indicated.
   1. Portland Cement: ASTM C 150, Type III, high early strength.
   2. Aggregate: ASTM C 33.
   3. Color Admixture: By Davis Colors, or equal, as required to achieve color as selected.
   4. Aggregate for exposed aggregate surface: As selected.
   5. Reinforcement - Standard 2-1/2 inch treads: Galvanized welded wire mesh, No. 7 and No. 10, 2 inch by 6 inch.

B. Tread style:
   1. Closed Riser: (2-1/2 inch thickness)
      a. Classic profile with integral detectable aggregate warning stripe.

C. Provide starter nosings with integral detectable warning stripe to match tread style and color.

   1. Landings: Of size indicated or required, matching treads in color and texture.

2.3 COLORS AND FINISHES

A. Colors: Reference Drawings for requirements.

B. Finishes: Walking surfaces of treads and landings shall have minimum coefficient of friction of 0.60, wet and dry.
   1. Exposed surfaces: Sandblasted; of uniform appearance in color and texture, free of bug holes, chips, and spalls; match approved field sample.

C. Field Application of Sealer: Comply with requirements of Section 03 31 13 for sealed concrete and traffic surface slip resistance performance requirements.
   1. Conform to sealer manufacturer's recommendations for application and maintenance of sealer.
      a. In geographic regions exposed to freeze-thaw conditions field-applied sealing the entire precast tread, riser and landing plank surface area, including joints, after installation is mandatory.

2.4 PHYSICAL PROPERTIES

A. Compressive strength: Minimum 5,000 psi.

B. Size 12” wide x 2-1/2” thick; length as required for width of stair.

C. Weight:
   1. Open Riser: 30 pounds per square foot at 2-1/2 inches thick; 36 pounds per square foot at 3 inches thick.
   2. Closed Riser: 37.2 pounds per lineal foot at 12 inch depth.
   3. Long-Span Closed Riser: 48 pounds per lineal foot at 12 inch depth.
   4. Landing Units: 30 pounds per square foot at 2-1/2 inches thick; 36 pounds per square foot at 3 inches thick.

D. Water absorption: Not more than 6.0 % average, not more than 7.0 % for any individual unit for standard colors.

E. Unit size: Within 3/16 inch of designated length, width and thickness.

2.5 ATTACHMENT ACCESSORIES

A. For Bolting to Steel stringers:
   1. 11 gauge galvanized steel angles, 1-5/8” x 3” x 7-1/4” long.
   2. 4 gauge galvanized steel starter nosing brackets.
   3. Non-Corrosive threaded inserts with 3/8” bolts, flat washer and lock washer.

2.6 FABRICATION

A. Stair treads, risers and landing planks shall be hand-made, wet-cast of cement conforming to ASTM C 150, Type III, and aggregates conforming to ASTM C 33.

B. Reinforcement - Standard 2-1/2” thick treads: Galvanized welded wire mesh, No. 7 and No. 10, 2 inch by 6 inch.

C. Reinforcement – Landing Planks: Galvanized rebar cage.

2.7 SOURCE QUALITY CONTROL

A. Concrete for treads, risers and landing planks shall be tested frequently to assure that mixes provide units having not less than 5,000 psi compressive strength at 28 days (average test strength not less than 4,500 psi).

B. Minor chips, hairline cracks, air voids and slight variations in color and finish are normal in precast concrete. When viewed in typical daylight illumination form a distance of 20 feet, minor cracks and air voids that cannot be seen with the naked eye are not grounds for rejection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that structural components of stairs are in place, aligned and level, within tolerances for proper installation of stair treads and risers, and required structural inspections have been completed.

3.2 INSTALLATION - GENERAL

A. Installation shall comply with the requirements of applicable building codes and state and local jurisdictions.

B. Install stair treads aligned, level and with uniform treads and risers throughout the extent of the stair.
   1. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
   2. Field modification of stair treads is not acceptable; unapproved modifications are grounds for rejection and replacement.
   3. Remove dust and dirt from stair tread units using oil-free compressed air.

3.3 CLEANING

A. Clean exposed surfaces of stair treads and risers. Use cleaners approved by precast tread manufacturer for precast concrete finishes and colors.

3.4 SEALING

A. Apply sealer in accordance with manufacturer's standards, and as necessary to maintain precast stair tread manufacturer's full warranty. Reference Section 03 31 13 for additional requirements.

3.5 COMPLETION

A. Prohibit construction traffic from using stair once precast components have been installed or provide effective protection to ensure work is neither soiled nor damaged due to subsequent use.

B. After installation and before completion, inspect precast concrete treads, risers and landing planks for construction damage; replace and seal damages treads, risers and planks.

C. Immediately prior to final acceptance of project, clean precast concrete treads, risers and landing planks.

END OF SECTION

SECTION 04 01 20 - MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for cleaning, repointing, and general masonry restoration work.

B. Unit Prices:
1. Cost for repointing of masonry (inclusive for block and cast stone) per square foot; including grinding out joints and pointing with new mortar as required for work of this Section.
2. Cost for cleaning masonry (inclusive for block and, cast stone) per square foot using gentlest means possible to achieve the intended result as required for work of this Section.
3. Cost for replacing damaged CMU masonry per square foot; including removal of damaged block and replacement with original block salvaged from the building [not applicable to cast stone nor terra cotta] and pointing.

1.2 DEFINITIONS

A. Water Spray Pressures: For use in describing Work of this Section; measured at the nozzle.
1. Low Pressure: 50 psi maximum at 3 to 6 gallons per minute.
2. Medium Pressure: 500 to 800 psi; 3 to 6 gallons per minute

1.3 SUBMITTALS

A. Product Data: Required for each product proposed for use in Work, spray equipment, and proposed mortar mixes.

B. Shop Drawings: Installation of reinforcing, pins, anchors, inserts, and related materials to stabilize and strengthen existing assemblies.
1. Restoration Proposal: Materials, methods, equipment and protection for each phase of restoration process.
2. Hidden Conditions Report: Detailed narrative and graphic description of nature and scope of concealed conditions discovered during the work.

C. Samples: Demonstrate complete range of color, and texture to be expected in the final work, but not less than six units for each type.
1. Block: .
2. Mortar: Six inches by 0.5 inch in plastic channels.
3. Anchors and Reinforcing: Each type required.

D. Field Samples:
1. Match of New and Salvaged Block to Clean Original.
2. Mortar: Six inches by 0.5 inch in plastic channels.
3. Masonry Cleaning: Demonstrate proposed cleaning method using processes and solution intended for the final work. Anticipate providing at least four samples of ten square feet. The first sample shall use plain water or very dilute cleaning solution.

Successive samples will use incrementally stronger methods until the gentlest method capable of achieving the required result as judged by the Architect has been achieved. The methods used in the accepted sample will be those required for the final work.

E. Certifications: Written and graphic evidence satisfactory to the Owner, substantiating Contractor's qualifications to perform the Work.

1.4 QUALITY ASSURANCE

A. Qualifications: Contractor with five years successful experience in comparable masonry restoration projects.
   1. Foreman: On site at all times Work is under way, skilled in masonry restoration techniques required for this Project, and have worked with this firm on five previous projects.
   2. Nozzle Operator for Abrasive Cleaning: SSPC C-7 Certified abrasive blast nozzle operator.

B. Regulatory Requirements: Provide the following in compliance with requirements of agencies having jurisdiction:
   1. Cleaning operations and disposal of cleaning solution and rinse water.
   2. Protection: Barriers, sidewalk bridging and other protection.

C. Field Samples: 25 Square feet of each type; Locate in an unobtrusive area as directed. Additional sample panels will be required until results acceptable to the Owner are achieved using approved materials and methods at no change in Contract amount. Approved samples will be retained as job standards for determining acceptability of final Work.
   1. Masonry Cleaning, Patching and Repairing: Demonstrate proposed materials and methods.
   2. Repointing: Raking out of joints and pointing for mortar, and sealant joints.

1.5 PROJECT CONDITIONS

A. Environmental Requirements: Exterior masonry, ambient air temperature has been above 40 degrees F for four days and will remain so for not less than seven days following completion of work. Maintain conditions required as necessary due to prevailing weather without change in Contract amount.

B. Existing Conditions: Owner assumes responsibility neither for apparent, and actual condition nor safety of masonry assemblies to be restored.

C. Required Area of Masonry Restoration Work: Entire North elevation of… [reference building elevations, gridlines, vertical datum as necessary to convey full scope of work].
   1. Assumed Quantity of Masonry to be Re-pointed: 4,000 square feet any combination of blockand cast stone. The actual quantity of work required will be determined during the Work as necessary for the conditions encountered. Unit Price for Re-pointing will be used to determine the cost of the final quantity of work performed.
   2. Quantity of Masonry to be Cleaned: Entire area as described above. Cleaning shall include removal of roots, vine remnants and all other biological growth.
   3. Assume Quantity of Damaged Block to be Replaced: 100 square feet (limited to CMU masonry only). The actual quantity of work required will be determined during the Work as necessary for the conditions encountered. Unit Price for Block Replacement will be used to determine the cost of the final quantity of work performed – quantity may be adjusted upwards or down depending on actual quantity of work performed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Cleaning Products: Sure-Klean Restoration Products, ProSoCo, Inc., Kansas City, KS.

B. Anchors: Subject to compliance with requirements, provide products of AA Wire Products Co., Dur-O-Wall, Inc., or Hohmann & Barnard, Inc.

C. Flexible Concealed Flashing: Afco Products Inc. Sandell Manufacturing Co., Inc., or York Manufacturing, Inc.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I, complying with staining requirement of ASTM C 91, white and gray as required.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144, grade as required to match appearance of clean existing mortar joints.
   1. Colored Mortar Aggregate: ASTM C 294, rounded sand required to match clean existing joints.

D. Colored Mortar Pigment: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes.

E. Water: Clean, free of oils, acids, alkalis and organic matter.

2.3 CLEANING PRODUCTS

A. Chemical Cleaning System: Combinations of the following as shown by approved field samples to be necessary for cleaning each masonry material and soiling condition encountered:
   1. 766 Masonry Prewash.
   2. Sure-Klean Restoration Cleaner.
   3. Sure-Klean Heavy Duty Restoration Cleaner.
   4. 509 Paint Stripper.

B. Water: Clean, free of oils, acids, alkalis and organic matter.

2.4 EQUIPMENT

A. Spray Equipment: Controlled application of chemical solutions and water at specified rates and pressures measured at nozzle.

B. Brushes: Natural fiber bristle.

C. Grinders: Power operated hand saws and grinders will be permitted only on written approval of Owner's Representative based on submission by Contractor of an approved quality control program and demonstrated ability of operators to use tools without damage to masonry.

D. Mechanical Mixers: Clean and in good operating condition.

2.5 MIXES

A. Mortar: Measure cementitious and aggregate materials in a dry condition by known volume or equivalent weight. Mix materials in a clean mechanical mixer; once dry materials are thoroughly mixed, add water to produce damp, unworkable mix, maintain mortar in damp condition for one to two hours. Add water in small portions until workable consistency is obtained. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Repointing Mix: ASTM C 270, one part Portland cement, one part lime, six parts aggregate.

C. Mortar Color: Match clean existing mortar using colored aggregates and pigments as approved by Owner's Representative and as necessary to achieve required results, do not exceed pigment-to-cement ratio of 1-to-10, by weight.

D. Chemical Cleaning: Most dilute solution necessary to achieve results obtain in approved field samples.

2.6 ACCESSORIES

A. Dowels: A 316 stainless steel, 3/8-inch diameter, threaded rods.

B. Masonry Anchors: Provide type suited to specific conditions encountered at each repair; including condition of supporting structure and structural requirements for repaired assembly.
1. Bent-Wire Ties: Provide 1.5 inches embedment in masonry, and not less than 0.625-inch mortar cover on face joints. Wire diameter not more than half of joint thickness unless otherwise acceptable.
2. Flexible Anchors: 2-piece anchors that permit differential movement between wall and structure, and resist tension and compression forces perpendicular to plane of wall.
a. Concrete Framework: 12 gage sheet metal dovetail and wire tie anchor extending to within 1 inch of masonry face.
b. Steel Framework: bent-wire tie welded to steel and triangular tie extending to within 1 inch of masonry face.

C. Masonry Retrofit Anchors: Helical lateral anchor pins 8 mm diameter, Type 304 stainless steel. Lengths will vary.
1. Dryfix Masonry Pins helical wall anchor as manufactured by Helifix, Weston, Ontario, Canada. Use dry without epoxy.
2. Blok-Lok Helical Wall Ties, as manufactured by Blok-Lok Limited, Weston, Ontario, Canada

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection: Prevent damage and injury to soil, vegetation, building surfaces, and finishes, automobiles and pedestrians during cleaning operations. Provide liquid strippable masking agent, polyethylene film and other protection as necessary.

1. Contain run-off from cleaning and dispose of in an approved manner, do not permit contact with soil.

B. Remove plant growth and soil from masonry joints and surfaces, cut roots and allow vegetation to dry before removal. Kill plant roots with ammonium sulfamate or approved treatment.

C. Examine terra cotta for cracks, spalls, and displacement. Using a plastic mallet, spot sound terra cotta at cracks and displaced units. Indicate hollow sounding units with nonpermanent chalk marking and review with Owner's Representative.

3.2 MASONRY CLEANING

A. Comply with ASTM D 5703 and requirements of this Section. Proceed with cleaning in an orderly manner, produce uniform appearance throughout, including corners, moldings, and interstices without damaging masonry surfaces. Comply with written recommendations of manufacturer of cleaning products.

B. Pre-wet masonry with low-pressure cold-water spray, apply prewash chemical cleaner by brush or roller use dwell time recommended by chemical cleaner manufacturer; rinse with medium-pressure cold water spray.

C. Apply chemical cleaner to wet masonry with low-pressure spray equipment, deep nap roller, or soft natural fiber brush; allow dwell time recommended by chemical cleaner manufacturer. Rinse masonry with medium pressure cold water spray, leave no chemical residue. Repeat chemical cleaning procedure once where necessary to achieve required results.

D. Contain cleaning solutions and rinse water, do not permit contamination of plantings, soils, and drainage systems.

3.3 REPOINTING

A. Preparing Joints: Remove mortar from open, shelled, cracked and defective joints to sound, solid mortar; provide uniform depth of not-less-than 3/4 inch nor more than 1-1/2 inches. Use masonry blade narrower than joint. Do not chip arrises. Do not widen joint, nor cut into adjacent units.
   1. Work not meeting approved job standard samples will be rejected, remove and correct as directed by Owner's Representative at no change in Contract amount.
   2. Brush, vacuum or flush joints, remove dirt and debris, rinse joints and clean bond surfaces of masonry and existing mortar.

B. Joint Pointing: Surfaces of joint shall be damp and free of standing water. Apply mortar in layers, compact each layer and allow to cure until thumbprint hard before placing next layer.
   1. Back-point uneven joints and joints more than 1 inch deep; apply mortar in 0.375-inch layers to uniform 0.5-inch depth.
   2. Point final 0.5 inch in three layers; each of the first two layers being approximately 0.1875 inch thick, and the final not less than 0.125 inch thick.
   3. Tool joints to match original appearance of joints, do not featheredge joints.
   4. Keep mortar damp (80 to 90 percent RH) for 72 hours by thoroughly soaking repointed joints at the beginning and end of each day until 72 hours are passed.

C. Sealant Joints: Refer to Section 07920 for requirements for resealing sealant joints.

3.4 MASONRY PATCHING

A. Repair cracks and voids less than 4 inches in greatest dimension; cut back area to a minimum depth of 1 inch, undercut edges to create a dovetail key for patch, remove debris and dirt.

B. Install patching dowels in epoxy, 2 inches into terra cotta body at opposing 45-degree angles, form a basket to hold mortar patch, space dowels 1 to 3 inches apart and 2 inches inside of edges. Provide a 0.5 to 1 inch of coverage between dowel end and face of masonry unit.

C. Paint isolated chips and spalls less than 1 inch in largest dimension with two coats masonry paint, comply with paint manufacturers recommendations for surface preparation, priming and application of paint.

3.5 CLEANUP

A. Remove excess mortar and foreign matter from masonry by using stiff natural fiber bristle brushes and low-pressure water spray. Remove mortar drops as they occur.

END OF SECTION

SECTION 04 22 00 – CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Work, materials and equipment necessary and required for a complete installation of concrete unit masonry of the types and configurations indicated. See Structural Notes on S-series drawing sheets for supplementary information; refer conflicts and ambiguities to Architect.

1.2 PROCEDURAL REQUIREMENTS

A. Preinstallation Conference: Comply with Project Meeting requirements. Review methods and procedures related to installation of concrete unit masonry work of this Section and coordination with other components and assemblies of the building cladding,
   1. Contractor's Project Schedule and work sequence, required tests and inspections.
   2. Coordination with work of Section 07 25 13, Section 07 92 00 and Section 08 44 00 for seals and transitions required to maintain integrity and performance of a continuous weather-resistive air barrier for the building enclosure complying with Performance Requirements.
   3. Coordination with Section 09 97 23 for application of high-performance urethane coating system on concrete masonry.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data for each type of manufactured product used in Work of this Section.

B. Shop Drawings: For fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 show bar schedules, stirrup spacing, diagrams of bent bars, arrangement and support of concrete reinforcement, and coordination with embedded and cast-in items.
   1. Shop Drawings: Fabrication, and placement of reinforcement, comply with ACI 315; show bar schedules, details, spacing, lateral ties and assemblies as required.
   2. Quality Control Submittals: Test reports in form required by test method, submit on same day test is made. Certification of product compliance with requirements.
      a. Testing Service: Certification of qualifications.

C. Samples: Provide 4 inch by 4-inch sets of three block faces for initial selection from manufacturer's complete range of standard and Premium colors, provide at least four color designations; provide separate set of full size block for final selection from initial color selection samples.

1.4 QUALITY ASSURANCE

A. Unit Masonry Mock-Up: Build full-height wall(s) and include masonry openings indicated. Provide bond, coursing and joint profiles as required for the Work.
   1. Mock-up will be reviewed for strict compliance with specified tolerances and aesthetic appearance of masonry work. Work product represented in the approved mock-up

shall be consistently reproduced in masonry work of this Section; work not conforming to control standard of the approved mock-up may be rejected.

2. Coordinate with work of Section 09 97 23 field sample application of high-performance urethane coating on unit masonry mock-up.

1.5 PROJECT CONDITIONS

A. Ambient air temperature above 40 degrees F during work, and for twenty-four hours prior to, and following stopping work.

1. Protect Work from damage due to exposure to extreme weather. Provide weather-resisting, and insulating enclosure, temporary heat and cooling as necessary. Replace Work damaged by extreme weather conditions.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Concrete unit masonry assemblies required as work of this Section are a component of the continuous weather-resistive air barrier required for compliance with California Title 24 Building Energy Efficiency Standards. Both the unit masonry assemblies and seals between unit masonry and other construction at openings, penetrations and transitions between different assemblies, including but not necessarily limited to weather-resistive air barrier assembly and aluminum fenestration assemblies, are required work of this Section and shall have an air leakage rate not exceeding 0.40 cfm per square foot nor otherwise contribute to a whole building air leakage rate in excess of 0.40 cfm per square foot as demonstrated by field testing of the installed work.

B. Performance Requirements: Materials and construction conforming with ACI 530.1 Specifications for Masonry Structures.

1. See Structural Notes on S-Series drawing sheets for additional requirements; refer conflicts and ambiguities to Architect.
2. Limit linear shrinkage to not more than 0.065 percent.

2.2 MATERIALS

2.2 MATERIALS

A. Concrete Masonry Units: From a single source, sizes, configurations and dimensions indicated. Provide shapes for lintels, corners and special molded shapes as required. Exposed surfaces finished, without cores, provide end and corner units finished to match faces where surface is exposed to view at jambs of opening, wall ends and soffit of lintels.

1. Hollow Concrete Block: ASTM C 90, medium weight smooth face finish, with no water-repellant admixture. Provide units size, configuration and coursing as required.
   a. CMU-1: Approved dark grey color to match the Project Control Sample; subject to required appearance match as demonstrated in approved samples the basis of design is Basalite GFM [mix for enhanced smooth finish] CMU.
   b. CMU-2: Approved light/white grey color to match the Project Control Sample; subject to required appearance match as demonstrated in approved samples the basis of design is Basalite GFM [mix for enhanced smooth finish] CMU; Natural only as produced at Carson City, Nevada plant.

c. CMU-3: As required for CMU-2 for sizes required.
d. CMU-4: Standard gray block.

B. Mortar: ASTM C 150, Type I, or Type II Portland Cement natural color and white cement as necessary to produce color required. Provide pre-blended cement-lime mortar with no integral water-repellent admixture.

1. Hydrated Lime: ASTM C 207, Type S.
2. Mortar Aggregate: ASTM C 144, 100 percent passing the No. 16 sieve for joints less than 0.25 inch.
3. Color: ASTM C 979, Established by approved samples demonstrating acceptable match to concrete masonry units in the colors and finishes required.

C. Grout: ASTM C 476, Prepackaged, fine or coarse as suitable for placement method required. Provide high-range water reducing admixture or other approved means of limiting water content in mixed grout without compromising placement characteristics.

1. Grout Aggregate: ASTM C 404.

D. Reinforcing: Comply with requirements of Section 03 20 00 and the General Structural Notes.

2.2 MORTAR AND GROUT MIXES

A. Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer, in compliance with referenced ASTM standards for mixing time and water content. When the use of admixtures and is approved, comply with manufacturer's recommendations for use.

1. Masonry Cement: ASTM C 91
2. Water: Clean and potable.

B. Cement-Lime Mortar: ASTM C 270, and as specified.

1. Type S Mortar: one part cement, one half part lime, four parts sand; 28-day compressive strength of 1800 psi.

C. Grout for Unit Masonry: ASTM C 476, and of consistency at time of placement that will completely fill all spaces to receive grout.

1. Grout Consistency: Fine in spaces less than 2 inches in horizontal direction, coarse in spaces 2 inches or more in least horizontal dimension, unless otherwise indicated.

D. Accessories:

1. Wall Cavity Guard, Vents and Weeps: Nonwoven, mesh inserts of recycled polyester fiber, provide two layers staggered in height, 10 and 6 inches tall in thickness recommended by manufacturer for cavity indicated. Provide Vent and Weep inserts sized for head joints of the same material in color to blend with masonry work. Mortar Net, CavClear, or approved.
2. Masonry Cleaner: Provide biodegradable, non-toxic and non-etching products and materials to the maximum extent possible; ProSoCo Enviro Klean or approved. Utilize lowest concentration and dilute solutions capable of removing each stain and soil condition.

3. Flashing: Provide flashing, materials, types and assemblies as specified in Section 07 60 00 Flashing and Sheet Metal and as indicated on the Drawings.
4. Masonry Sealer: Low VOC, reactive polyurethane emulsion specifically formulated for use on masonry substrates and having a record of successful in-service performance. Edison Coatings, Inc. Aquathane UA-210 Type NCL with Type XL additive to second coat, flat gloss is the basis of design, FSC Coatings, Inc., RainGuard or equal.
   a. Primer: Comply with sealer manufacturer's recommendations for substarte type and conditions encountered at the time of application; Edison 240 is the basis of design, FSC Coatings, Inc., RainGuard or equal.

2.3 SOURCE QUALITY CONTROL

A. Masonry Preconstruction Testing Service: Contractor responsibility; testing shall conform to ASTM E 329 standards.

B. Unit Test: Test each type, class and grade of material.
   1. Concrete Masonry Units: ASTM C 140.
   2. Mortar Tests: ASTM C 780.

C. Prism Methods: For each wall type indicated test masonry prisms per ASTM E 447, Method B. Test one set of prisms at 7 days and one set at 28 days.
   1. Concrete Masonry Prisms: Height-to-thickness ratio not less than 1.33 nor more than 3.

D. Flexural Bond Strength Tests: ASTM E 518; place prism with tooled joints facing down.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify tolerances of adjoining materials, including alignment with plan dimensions, before beginning work. Commencement of masonry work indicates acceptance of surrounding conditions.
   1. Coordinate placement of dowels for reinforcing of masonry work with work of Section 03 20 00 Concrete Reinforcement ensure proper location and compliance with tolerances and clearances, including required coverage of rebar.
   2. Concrete foundations not having a level alignment within plus or minus 0.5 inch (total tolerance of 1 inch) for all points on the as-cast surface shall be corrected to comply with the tolerance specified in this Section prior to installation of masonry.

3.2 PREPARATION

A. Layout walls for accurate spacing of surface bond patterns with uniform joint widths, accurately locate openings, control joints, returns, and offsets.

   1. Brace walls against wind and earthquake loads until the wall has been grouted and integrated into the building structure.

B. Reinforcement: Clean of loose rust, mill scale, earth, ice, and materials which will reduce bond to mortar or grout; without kinks, bends, and reduced cross-section not shown on drawings.

1. Provide minimum clearance for reinforcing of 0.25 inch from the masonry. Provide minimum 1 inch of grout cover on horizontal reinforcing. Secure reinforcing prior to grouting at intervals not exceeding 200 bar diameters.

C. Place reinforcement at spacing and locations indicated and prevent displacement. Except as otherwise indicated, provide a clear distance between bars of one inch, or one bar diameter, whichever is greater.
1. Columns, Piers and Pilasters: 1.5 inches, or 1.5 times bar diameters, whichever is greater. Provide lateral ties as indicated.
2. Reinforcing Bars: Straight except for bends around corners and where bends or hooks are indicated.
3. Complete installation of all reinforcing prior to grouting masonry cells.

D. Splices: Lapped, and wire tied; at locations indicated unless otherwise acceptable to the Architect.
1. Minimum Lap: 18 inches, and as required by Structural plans.

E. Weld splices where indicated. Comply with the requirements of AWS D1.4 for welding materials and procedures.

F. Metal Ties: Mortar cover of 0.6250-inch exterior wall face; 0.5 inch elsewhere.

G. Preparation of Grout Spaces: Cleanout holes shall be provided through face of unit masonry for all cells at the bottom of each pour. Inspect and clean, remove dirt, mortar droppings, loose masonry and other foreign materials from grout spaces, and close cleanout holes with matching masonry units; brace closures to resist grout pressures.
1. Provide continuous unobstructed cell area not less than 2 inches by 3 inches.
2. Close cleanout holes so the surface is similar to the rest of the wall, face shell plugs shall cure at least 48 hours before grouting. Brace covers on the clean out holes as required to resist the pressure from the grout.

H. Cells of Reinforced Masonry Units: Grouted solid and vibrated in place; stop grout 1 inch below the top of a course to form a key off-set from masonry coursing. Prevent segregation of grout mix during transport and placement. Minimize grout splatter and ensure reinforcing and masonry unit surfaces are fully encased with each grout lift.
1. Grout beams in one continuous operation.
2. Low Lift Grouting: Lifts of 2 feet or less.
3. High Lift Grouting: Minimum dimensions of the grout space shall be 3 inches. Place grout in maximum 4-foot lifts, and then wait approximately 30 minutes between lifts. The full height of each pour shall be poured in 1 day. Maximum height of a pour is 12 feet.

3.3 ERECTION

A. Lay masonry in pattern indicated, provide uniform coursing, bonding, color and texture. Match new Work to existing adjacent work, and Work in-place unless otherwise indicated.
1. Bond Pattern: Running bond, unless otherwise indicated, center vertical joints above units in course below.
2. Adjusting Set Units: Do not strike nor force; remove unit, clean off mortar and reset in fresh mortar.
3. Mix mortar in proportion necessary to comply with Project performance requirements and referenced standards; incorporate water repellant admixture in exterior assemblies unless otherwise approved.

4. Provide Machine Ground finish surface on all exterior surfaces exposed to view and as required for interior surfaces exposed to view in select locations.

B. Maintain 0.375-inch joint width unless otherwise indicated, except for minor variations required to maintain bond alignment.
1. Concealed Joints: Tool flush, unless otherwise indicated.
2. Exposed Joints: Rodded, unless otherwise indicated.

C. Provide control joints to comply with NCMA recommendations and where shown on approved shop drawings. Interrupt reinforcement at movement joints unless otherwise indicated.
1. Movement Joints: Provide elastomeric sealant complying with Section 07920 requirements. Sealant color and tooling of joint shall provide close visual match to mortar joints.

D. Lay masonry units with full mortar coverage on horizontal and vertical bedding planes, do not slush head joints. Bed CMU webs in mortar at piers, columns, pilasters, and cells adjacent to cavities to be grouted. Provide full mortar bed including area under cells at starting course of footings where cells will not be grouted. Provide mortar types specified and where indicated.
1. Type S Mortar: Structural masonry.

E. Build-in items to be installed as work of this Section, fit solidly with masonry.
1. For items embedded in core, place layer of metal lath in the joint below and rod grout into core. Grout core for three courses under bearing plates, lintels, and similar items, unless otherwise indicated.
2. Provide EPS board insulation around perimeter of exterior frames.
3. Provide recess for flexible sealant around perimeter of exterior frames and openings as indicated.
4. Voids At Built-in Items: Grouted solid unless otherwise indicated.

F. Provide concealed flashing in masonry work at shelf angles, lintels, ledges and obstructions to the downward flow of water in the wall to divert water to the exterior. Install as indicated and as specified in Section 07 60 00, on smooth, even surfaces, sloped where required.
1. Penetrations and Joints: Sealed, overlap end joints 1.5 inches, interlock sheet metal flashings.
2. Extend flashings through exterior face of masonry and turn down to form drip, unless otherwise indicated.
3. Extend flashing the full length of lintels and shelf angles and minimum of 4 inches into masonry at each end; ends that are not interlocked shall be turned up 2 inches to form a pan.
4. Through-wall Flashing: From exterior face to within 0.5 inch of the interior face of masonry in exposed work; from exterior to interior and turn up 2 inches at interior surface in concealed work. Turn flashing up 4 inches in cavity.

G. Provide vertical and horizontal joints where shown. Interrupt reinforcement at movement joints unless otherwise indicated.
1. Build-in non-metallic joint fillers at locations indicated to accommodate forces, and movement anticipated and shown. Provide beneath shelf angles supporting masonry.
2. Expansion Joints: Install as indicated and as recommended by manufacturer. Overlap ends of units 4 inches in direction of water flow; seal ends below grade, and junctures with horizontal units.

H. Do not apply uniform loads for twelve hours nor concentrated loads for three days after building walls and columns.

I. Clean exposed surfaces of set masonry, remove mortar spills and loose units, prior to laying fresh masonry wet units lightly as necessary. After Work is thoroughly set and cured. Comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.
   1. Remove mortar particles by hand using non-metallic tools.
   2. Chemical Cleaning: Provide for removal of efflorescence and other stains in accordance with approved samples. Comply with manufacturer's recommendations for cleaning. Use most dilute solution possible to obtain required results. Protect adjacent surfaces from damage, cover with strippable liquid masking agent, or other approved protection.

3.4 CONSTRUCTION TOLERANCES

A. Variation from Plumb: Do not exceed the following limits.
   1. Vertical surfaces and arrises 0.25 inch in 10 feet, 0.375 inch in single story up to 20 feet, and 0.5 inch in 40 feet or more.
   2. External corners, expansion joints, control joints and conspicuous lines, 0.25 inch in 20 feet and 0.5 inch in 40 feet or more.
   3. Vertical alignment of head joints plus or minus 0.25 inch in 10 feet, 0.5 inch maximum.

B. Variation from Level: Do not exceed the following limits.
   1. Bed joints, lintels, sills, parapets, and conspicuous lines: 0.25 inch in any bay or 20 feet maximum, 0.5 inch in 40 feet or more.
   2. Top of bearing walls: 0.125 inch between adjacent floor elements in 10 feet or 0.0625 inch within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 0.5 inch in 20 feet and any bay, 0.75 inch in 40 feet or more.

D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 0.25 inch nor plus 0.5 inch.

E. Variation in Mortar Joint Thickness: plus or minus 0.125 inch from dimension indicated; maximum bed joint thickness limited to 0.5 inch.

3.5 FIELD QUALITY CONTROL

A. Unit Test: Each type, grade and class of masonry unit used in Work of this Section by the following methods.
   1. Concrete Masonry Units: ASTM C 140.

B. Prism Test: ASTM E 447, Method B for each type of wall construction indicated. Prepare prisms as specified for preconstruction testing.
   1. Sample Incidence: Two prisms for each 5000 sq. ft. of wall area installed.

C. Flexural Bond Strength Tests: ASTM E 518; place prism with tooled joints facing down.

D. Test each type of mortar used in accordance with ASTM C 780.
   1. Sample Incidence: As required to evaluate mortar from each increment of masonry units from which tests samples are taken.

E. Tests Results: Indicate compliance with requirements for Work to be accepted, and there shall be no other indication of noncompliance.

3.6 PROTECTION

A. Protection: During precipitation, and at end of each day's work, cover top of walls, openings, penetrations, and cavity with waterproof sheeting 24 inches down each side, secured in place.

B. Prevent grout, mortar and dirt from soiling masonry surfaces, cover masonry and adjacent ground surface as necessary; remove grout and mortar spills when they occur, do not permit to set.

C. Provide final protection and maintain conditions in a manner acceptable to Installer and Architect, maintain Work free of damage and deterioration until substantial completion.

END OF SECTION

SECTION 05 12 00 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of structural steel work is as indicated and scheduled.
   1. Comply with requirements of the General Structural Notes on S0.01 and S0.02; completed structures shall support loads and resist forces per criteria therein.

B. Related Sections:
   1. Section 05 30 00 Metal Decking.
   2. Section 05 50 00 Metal Fabrications.

1.2 SUBMITTALS

A. Product Data: Test reports, mill and manufacturer's specifications, and data required to show compliance with these specifications.
   1. Coatings data for shop applied coatings and demonstration of required coordination with filed applied coatings.

B. Shop Drawings: and include complete details and schedules for fabrication and erection procedures and sequence, connection, and anchorage of all structural members.
   1. Welding Symbols: Standard AWS, show size, length, and type.
   2. Bolts and Anchorages Identify Whether Installed in Shop or the Field: Shown on setting drawings, and templates regardless of entity providing them.
   3. Embeds: Provide location plan for all components fabricated as work of this Section to be embedded in concrete structure and coordinate placement of embedded components with work of Section 03 11 000 and Section 03 30 00.

C. Erection Plan: Sealed by an engineer registered in the state of the Project and includes erection sequence, bracing requirements, and details identifying stability requirements during construction.

D. Field Survey Report: Establish line and location, structure elevations, anchor points, and similar points and dimensions as required for field engineering. Highlight all discrepancies between contract documents and field conditions and indicate corrective measures.
   1. Certify the location of the structural steel as erected complies with Project requirements for elevation, location and alignment and is within the specified tolerances.

E. Certifications:
   1. Manufacturer's certified test reports for load indicator washers and tension control bolts
   2. Mill test reports for bolts, nuts and washers
   3. Welding Procedures: Approval by the Owner's Testing Agency.
   4. Welding Operator AWS Certification: In triplicate, Architect action not required.
   5. Quality Assurance Plan: Formal statement of quality control actions to be taken by Contractor's fabricator in their performance of the work.

F. Welding Procedures: AWS D1.1 and D1.8 for prequalified and non-prequalified welded joints. Document welding procedures proposed for the Work and qualification tests per AWS D1.1 for non-prequalified welded joints.

1.3 QUALITY ASSURANCE

A. Fabricator Qualifications: 5 years successful experience fabricating structural steel having elevated requirements for appearance for work exposed to view in the completed structure. Facilities, and personnel having capacity, and expertise necessary to produce the work of the quality and quantity required per the Contractor's Schedule.
   1. Fabricator: Participant in the AISC Certification program and is designated an AISC Certified Plant, Category QMS; alternative means of demonstrating qualifications for control of appearance in the work including but not limited to work samples may be acceptable as required for Substitutions
   2. Source Quality Control: System of standards and procedures applied by the fabricator ensuring work of this Section consistently achieves the characteristics, properties and attributes required within the specified tolerances such that it is fit for the use intended.

B. Welding Process and Operator Qualification: In accordance with AWS Standard Qualification Procedure.
   1. Comply with State of California and local jurisdiction requirements for welder and welding operator performance qualification.

C. Codes and Standards: Contractor responsibility to provide Work complying with contract requirements shall not be altered by statements made in referenced standards and documents. Comply with the following, except as otherwise indicated.
   1. AISC 303 "Code of Standard Practice for Steel Buildings and Bridges".
   2. AISC 360 “Specification for Structural Steel Buildings.
   3. AISC 341 “Seismic Provisions for Structural Steel Buildings”
   4. RCSC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Structural Connections.
   5. AWS D1.1 "Structural Welding Code".
   6. AWS D1.8 “Structural Welding Code – Seismic Supplement”.
   7. ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use".

1.4 DELIVERY, STORAGE AND HANDLING

A. Protect steel from damage and deterioration, store off ground and to permit access for inspection. Repair and replace damaged material as directed.

B. Fasteners: Comply with storage requirements of AISC Specification for Structural Joints using ASTM A325 or A490 Bolts.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Work Exposed to View: Free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove blemishes prior to preparation and application of surface finish.

B. Structural Steel Shapes, Plates and Bars: ASTM A36 and A992 as applicable for components required.

C. Cold-Formed Steel Tubing: ASTM A 500, Grade B oe ASTM A 1085.

D. Steel Pipe: ASTM A 53, Type E or S, Grade B; or ASTM A 501.

E. Steel Castings: ASTM A 27, Grade 65-35, medium-strength carbon steel.

F. Headed Stud-Type Shear Connectors: ASTM A 29, Ac old finished carbon steel; with dimensions complying with AISC Specifications.

G. Anchor Bolts: ASTM A 307 or ASTM F1554, Grade 55 non-headed type unless otherwise indicated.

H. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low- carbon steel bolts and nuts, hexagonal heads at exposed connections, hexagonal or square at other locations.

I. High-Strength Threaded Fasteners: Quenched and tempered, heavy hexagonal structural bolts, and nuts, with hardened washers.
   1. ASTM F 3125 Grade A325 or A490.
   2. ASTM F1852 Type1, with Treads included (N).
   3. Nuts shall conform to ASTM A563 and washers to ASTM F436
   4. Direct tension indicator washers may be used at Contractor's option.

J. Electrodes for Welding: Comply with AWS Code.

K. Non-Shrink Grout: Comply with requirements of Section 03 30 00.

L. Non-Shrink Grout: Natural aggregate, prepackaged and conform to ASTM C1107, provide Masterflow 928 by Master Builders or approved.
   1. Fluid Grout: Determined by flow cone, CRD-C611-81 with a flow of 22 to 29 seconds one hour after batching, at 40 to 100 degrees F.
   2. Strength: 2,500 psi at 24 hours, 4,500 psi at three days, and 5,000 psi minimum at 28 days.

2.2 FABRICATION

A. Shop assemble Work to greatest extent possible and minimize field handling. Comply with AISC Specifications, accurately align members and provide camber where indicated.
   1. Complete assembly before starting finishing operations. Mark and match-mark members for field assembly.

B. Connections: Provide as specified and as indicated.

1. High Strength Bolts: Conform to RCSC "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts" provide at following:
   a. Principal bolted connections.
   b. All bolted connections.

C. Welded Construction: Comply with AWS Code.

D. Shear Connectors: Shop weld. Space as indicated, prepare surfaces, and install as recommended by manufacturer.
   1. Headed Stud: Automatic end welding.

E. Steel Wall Framing: True, straight, and square.

F. Penetrations: Normal to surface unless otherwise required, neither flame-cut nor enlarge holes by burning; provide specialty items as indicated.

G. Expansion Joints: Provide in steel shelf angles; align with vertical expansion joints as indicated.

H. Hot-Dip Galvanizing: Comply with ASTM A 123; Coating Grade 100 on members exposed to weather and not less than Grade 65 for members required to be galvanized and not having exposure to weather.
   1. Galvanized Components Required to be Painted: Treat galvanized substrate as necessary to ensure effective bond of paint whether shop or field applied.

2.3 SOURCE QUALITY CONTROL

A. Mill Test Reports: Bolts, Nuts and Washers Complying with ASTM A325, Type 1, or ASTM A490 and Project requirements. Certification numbers shall appear on product containers and correspond to certification numbers on mill test report. Mill test report must be supplied to both purchaser and Owner's Testing Agency.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Prior to beginning erection, verify elevation of bearing surfaces, and anchor locations. Do not proceed with Work until conditions are satisfactory, start of erection will be interpreted as erector's acceptance of conditions.

3.2 PREPARATION

A. Temporary Support and Connections: Provide to align and stabilize members during erection. Fill holes with plug welds and grind smooth where Work will be exposed in completed structure.

B. Surface Preparation: Clean bearing and bonding surfaces. Comply with requirements of referenced AWS and AISC documents.

3.3 ERECTION

A. Bases and Bearing Plates: Plumb and level unless otherwise indicated; shim as necessary. Do not leave wedges exposed in permanent Work.
   1. Grouting: Fill all voids between bearing surfaces. Comply with grout manufacturer's recommendations for installation and curing. Finish exposed surfaces as indicated and required.
   2. Grouting: Comply with installation requirements of Section 03 30 00.

B. Steel Structure to Remain Exposed to View: Exercise a high degree of craftsmanship and care in handling and installing appropriate to finish grade components. Use tools and methods that will minimize the potential of damage to these components during the work. Protect installed work from damage during subsequent construction activities and damage from exposure to weather.
   1. Field Assembly: Accurately align members and adjust as necessary due to discrepancies in elevations and alignment before permanently fastening.

C. Steel Framing: Accurately set to lines and elevations indicated; conform to tolerances in referenced AISC documents.
   1. Allow for differential between temperature at time of erection, and mean service temperature anticipated for completed structure.
   2. Splices: As indicated.
   3. Seams in Cylindrical Members: Orient columns so that welded seams are towards the adjacent W18 beam. Orient all other components with seams up.

D. Welding: Comply with referenced AISC and AWS documents including temporary connections, alignment and bearing.
   1. Steel Structure to Remain Exposed to View Conceal field welds wherever possible, remove spatter and repair shop coatings. Visible welds shall present a neat, uniform appearance and consistent profile. Weld show-through shall be controlled such that welds are not readily visible in finished material when viewed at a distance of 10 feet.

E. Bolting: Comply with referenced AISC documents, furnish templates and other devices necessary for presetting bolts and anchors.
   1. Unfair Holes: Ream holes that must be enlarged. Drift pins and burning are not acceptable except in secondary bracing members.
   2. Bolts in Concrete and Masonry: Comply with installation requirements of Division 3 and Division 4.

F. Gas Cutting: Not permitted except for secondary members not under stress, finish cuts straight, and smooth, as required.

G. Repair of Shop Applied Coatings: Immediately after erection, prepare field welds, bolted connections, and damaged shop coatings. Recoat using approved field repair materials and methods. Provide a minimum dry film thickness of 4 mils. Prime paint repairs shall be invisible after final finish painting.
   1. Galvanizing: Comply with ASTM A 780 and provide uniform appearance in the repaired work.

3.4 FIELD QUALITY CONTROL

A. Engage an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.

1. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
3. Testing agency may inspect structural steel at plant before shipment; however, Architect reserves right, at any time before final acceptance, to reject material not complying with specified requirements.

B. Correct Work which inspections and laboratory test reports indicate does not in comply with requirements. Perform additional tests, at Contractor's expense, as required.

C. Inspections:
1. Bolted Connections: Requirements of referenced AISC documents.
2. Welds: Visual inspection and tested as follows:
   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 109; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
   c. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
   d. Ultrasonic Inspection: ASTM E 164.

D. Field Survey: Make an accurate survey of alignments and elevations of all steel members as noted on the drawings.
1. During construction of the steel frame, the Contractor shall survey the column locations and splice elevations as each column tier is erected. Submit survey reports indicating this information within 24 hours for review prior to erecting the subsequent tiers.
2. Permanent benchmarks shall be established by a registered professional engineer employed by the Contractor in accordance with the requirements of contract documents.
3. Should locations vary beyond the allowable tolerances, notify the Architect/Engineer and take necessary corrective measures and modify details and/or procedures as required and approved.

END OF SECTION

SECTION 05 30 00 – METAL DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of metal decking is indicated on drawings, including basic layout and type of deck units required.

B. Related Sections:
1. Section 03 30 00 Cast-In-Place Concrete.
2. Section 05 12 00 Structural Steel.

1.2 SUBMITTALS

A. Product Data: Manufacturer's specifications, installation instructions and certification of compliance with requirements.
1. Test reports for mechanical fasteners and acoustic roof deck performance.

B. Shop Drawings: Plans, sections, and details to show deck type, gage, layout, span orientation, anchorage, end closure, sumps, cants, joints and accessories.
1. Primary and secondary structure and supplemental framing.
2. Size and location of holes penetrations, and openings through deck.
3. Types of welds and weld patterns, including weld washer requirements.
4. Location and patterns for button punching.
5. Layout of steel shear connector studs.

C. Quality Assurance:
1. Certificates for welding procedures and operators.
2. Mill Test Reports.

1.3 QUALITY ASSURANCE

A. Welding Qualifications: AWS D1.1 for welding processes and operators.

B. Regulatory Requirements: Provisions of the following codes and standards, unless otherwise required.
1. AISI Specification for the Design of Cold-Formed Steel Structural Members.
2. AWS D1.3 Structural Welding Code - Sheet Steel.
3. SDI Design Manuals for Floor Decks and Roof Decks.

C. Participate in Pre-Erection Conference as required by Section 05 12 00.
1. Verify Coordination of requirements for painted finish and ensure compatibility among coatings provided as work of other Sections and Schedule for field finish painting work of Section 09 90 00.

PART 2 - PRODUCTS

2.1 SYSTEMS DESCRIPTION

A. Design Requirements: Comply with Steel Deck Institute Design Manual SDI 31.
   1. Deck connections not sized on the drawings, shall be designed by the Contractor based on the manufacturer's minimum recommendations for the plan configurations and loading required.
      a. Button Punching: Roof deck side lap connections only where specifically indicated; other connections shall comply with manufacturer's recommendations.
   2. Secondary Framing: Support deck at edges, openings and columns as indicated and to provide deck flutes a minimum 2 inches of bearing. Where details are not applicable to Project conditions design and provide secondary framing complying with Section 05 12 00.
   3. Accessories: Provide types necessary to complete deck assembly required including but not limited to edge forms, end closures, sump pans, closure strips, and cover plates. Fabricate components to comply with requirements for decking. Provide tight-fitting closures for all openings, edges and penetrations configured for required fill in composite construction.

B. Performance Requirements: Comply with structural criteria in the General Structural Notes on S0.01 in addition to requirements of this Section. Capacity of decking shall be per the current ICC-ES Report.
   1. Install and anchor roof deck units to resist gross uplift loading indicated in General Structural Notes and as required for corners, edges, overhangs and areas of discontinuity.
   2. Roof deck and connections to the supporting structure shall resist uplift loads of 35 pounds per square foot or the loads indicated, whichever is greater.

2.2 MANUFACTURED COMPONENTS

A. Acceptable Manufacturers: Subject to decking compliance with Project requirements, provide products manufactured by a Steel Deck Institute member.

2.3 MATERIALS

A. Steel Sheet:
   1. Cold Rolled Steel: ASTM A 611, Grade C.
   2. Galvanized Steel: ASTM A 653, G60.

B. Structural Steel: ASTM A 36.

C. Shear Connectors:
   1. Headed Stud: ASTM A 108, Grade 1015 or 1020, cold finished carbon steel; in dimensions complying with AISC specifications.
   2. Strap: ASTM A 570, Grade D, hot-rolled carbon steel.

D. Paint: Manufacturer's standard baked-on, rust-inhibiting paint, for application to chemically cleaned and phosphate treated metal.
   1. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces.

E. Flexible Closures: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.

F. Acoustic Closures: Manufacturer's standard mineral fiber.

G. Silicone Sheet Seals and Compression Seals: Comply with Section 07 92 00

2.4 FABRICATION

A. Metal Decking: Metal thickness, configuration, and cell depth, width, and interval indicated; comply with applicable SDI specifications for composite and noncomposite roof and floor deck.
   1. Non-composite Units: As indicated on S series structure drawings.
   2. Composite Units: Permanent form and positive bending reinforcement for structural concrete slab.

B. Cell Closure Strips: 18 gage (0.045 inch) sheet steel, form to provide tight-fitting closures at open ends and sides of cells.

PART 3 - EXECUTION

3.1 PREPARATION

A. Concrete Supporting Structure: Cured, dry, and achieved sufficient strength to support decking prior to installing units.

B. Prevent overloading of structure due to stock piling of material and installation of decking.

C. Do not use deck units for storage or working platforms until permanently secured.

3.2 INSTALLATION

A. Deck and Accessories: Comply with manufacturer's recommendations, final shop drawings, and specifications in compliance with SDI C, SDI NC, and SDI RD.
   1. Placement: Flat, true, square, and aligned, bearing uniformly on supporting structure, do not deform laps nor interlocks. Keep deck cells free of damage and debris.
   2. Fasten to structure free of warp and excessive deflection.
   3. Cut and fit to projections, and other Work.
   4. Provide supplemental structural steel support framing for metal deck where normal deck bearing is precluded by column flange plates or other framing members, and around minor openings where indicated.
   5. Place only reinforcing and items shown to be embedded in concrete fill on composite deck.

B. Welding: Manual shielded metal arc welding, comply with AWS requirements and procedures. Use welding washers where recommended by deck manufacturer.
   1. To the extent practical locate welds such that they will be concealed from view in the installed work, remove spatter and repair shop coatings. Visible welds shall present a neat, uniform appearance and consistent profile. Weld show-through shall be controlled such that welds are not readily visible in finished material when viewed at a distance of 12 feet.

C. Deck Fastening: Fusion welds or elongated welds of equal strength, at every support. Diameter and spacing of welds as follows.
   1. Floor Deck: 3/4 inch diameter, 12 inches center-to-center, not-less-than 2 welds per unit.
      a. End Closures: Tack weld, or self-tapping No. 8 machine screws at 4 feet center-to-center maximum.
   2. Roof Deck: 12 inches center-to-center at support, and as required for lateral force resistance, and diaphragm shear indicated.
   3. Floor Deck Side Laps: Fasten between supports 36 inch o.c., maximum.
   4. Roof Deck Side Laps: Fasten between supports as required to resist the diaphragm shears noted on the drawings.

D. Shear Connectors: Weld through deck to supports conform to manufacturers specifications. Do not weld through lapped ends nor multiple deck units.

E. Maintain deck strength, and continuity, reinforce penetrations and areas supporting concentrated point loads for other work. Provide the following as necessary and required:
   1. Joint Covers: As recommended by deck manufacturer unless otherwise indicated.
   2. Sump Pans: Fit to deck opening, recess 1-1/2 inch below deck surface, unless otherwise indicated, weld to deck at corners and 12 inches o.c.; cut and seal pan as required.
   3. Cant Strips: Weld to top surface, and steel framing at 12 inches o.c. Lap joints 3 inches, and anchor with galvanized sheet metal screws; anchor to nailers with galvanized nails.
   4. Closure Strips: Weld to open ends, edges of roof decking, and in voids between decking and other construction. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.
      a. Provide flexible closure strips adhesively installed, at Contractor's option when acceptable to Architect.
   5. Sequence cutting of openings to maintain optimum deck strength during and after erection and to effectively contain cement paste when concrete is placed and finished.

F. Hanger Slots and Clips: Manufacturer's standard, UL approved devices to receive hangers for support of ceiling construction, air ducts, diffusers, and lighting fixtures. Install between cells of lower sheet at maximum 14 inches center-to-center each way, 9 inch from walls at ends, and 12 inches from walls at sides, unless otherwise indicated.

G. Concrete Placement on Composite Deck: Prevent damage to deck due to placing operations including overloading of deck, excessive deflection and denting of flutes. Verify reinforcing has been properly placed and supported, including reinforcing required for deck penetrations.

H. Repair of Shop Coating: Immediately after erection, clean field welds, connections, and damaged areas of shop coatings. Recoat damaged areas using same material used in shop, and blend into adjacent surface so that repair is not visible when viewed from a distance of 15 feet under any lighting condition. Coordinate with requirements for field finish painting in Section 09 90 00.

3.3 FIELD QUALITY CONTROL

A. Welded decking in place is subject to inspection and testing. Cost of removing and replacing portions of decking for testing purposes will be borne by Owner for Work found to be satisfactory. Remove and replace defective Work at no change in Contract Amount

END OF SECTION

SECTION 05 40 00 – COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for cold formed metal framing systems having 14 and 16 gage components. Metal Framing Systems for units 18 gage and lighter are work of Section 09 22 16.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Work of this Section includes framing for support and attachment of other work, including but not limited to work of the Sections listed here. Coordinate location with requirements for the work to be attached and supported. Provide components configured for attachment requirements and sized to support imposed loads in compliance with system description requirements.
   1. Section 03 30 00 Cast-In-Place Concrete: Embeds for framing attachments to concrete structure.
   2. Section 05 50 00 Metal Fabrications: Support of channel revetments, steel trim components and other fabrications.
   3. Section 06 40 00 Architectural Woodwork: Support of custom casework assemblies.
   4. Section 08 41 00 Aluminum Storefront: Support of storefront assemblies
   5. Section 08 44 00 Glazed Aluminum Curtain Wall: Support of curtain wall.
   6. Section 10 71 13 Exterior Sun Control: Metal framing support of tributary load from sunshades.

B. Pre-Installation Conference: Comply with requirements for Project Meetings.
   1. Confirm the work has been properly coordinated for metal framing assemblies for support and attachment of other work as required.

1.3 SUBMITTALS

A. Product Data: include but is not limited to manufacturer's ICC-ES report for components and complete structural information necessary to demonstrate compliance for work of this Section with System Description and Project requirements.

B. Shop Drawings: Stamped by Registered Structural Engineer in the state where the Project is located, include calculations and the following.
   1. Member gages, spacing and sizes.
   2. Shop and field assembly details including cuts and connections.
   3. Type and location of welds, bolts and fastening devices.
   4. Supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.
   5. Coordination details for related, supported or adjoining work.

C. Shop Drawings: Framing, supports, and assemblies required as work of this Section for connection and support of other work, including but not limited to the Sections noted under 1.2.A above shall be stamped by Contractor's California-Registered Structural Engineer

demonstrating compliance with System Description and Project requirements; include calculations and the following.

1. Member gages, spacing and sizes.
2. Shop and field assembly details including cuts and connections.
3. Type and location of welds, bolts and fastening devices.
4. Detail bracing, bridging and accessories necessary for complete stable installation.
5. Coordination details for related, supported and adjoining work.
6. Secondary supports and supplemental framing.

1.4 QUALITY ASSURANCE

A. Manufacturer: Provide products of a manufacturer complying with local/regional materials requirements. Member of Steel Stud Manufacturers' Association or Certified Steel Stud Assoc. (membership in the Steel Framing Industry Assoc. is not acceptable) and producing ICC-ES certified structural components.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Complete structural solution for metal framing assemblies is not provided by the contract documents; final design of metal framing assemblies is the Contractor’s responsibility as work of this Section. Provide components configured for assembly types and attachment requirements, sized to support loads imposed by the work to be supported.
   1. Comply with AISI Code of Standard Practice for Cold-Formed Steel Structural Framing and Specification for the Design of Cold Formed Steel Structural Members
   2. Fire-Rated Assemblies: UL Listed.
   3. Framing and Secondary Supports: Provide at each location necessary for the support and connection of work of other Sections. Coordinate requirements for location, extent, member type, gage, spacing and connection with the work to be supported. Transfer loads to primary structural system to comply with Performance Requirements of this Section and as necessary for the work being supported.
      a. Provide stud sizes necessary for wall assembly dimensions indicated; provide steel alloy type, gage, component spacing, connections and other details as necessary for the assembly to comply with System Description requirements.
   4. Design of embed for connection of structural metal framing assemblies to concrete structure is required work of this Section, and as indicated on S0.51 and S0.52
   5. Provide close coordination of structural metal framing is required as work of this Section to ensure the required support and attachment for work of other Sections.
   6. Metal framing including braces and secondary supports without limitation shall be concealed within wall assembly in dimension indicated or above finish ceilings, exposed braces are not acceptable.
      a. Coordinate metal framing assemblies with other work required in wall cavity and ceiling plenums to eliminate conflicts.

B. Performance Requirements: Structural Properties complying with AISI "Specification for Design of Cold-Formed Steel Structural Members"
   1. Metal Framing: Comply with criteria in the General Structural Notes on S0.01- S0.02 and resist tributary loads imposed by work to or supported by metal framing and transfer loads to the primary building structure.

2. Wind Design Pressure: Per 2022 CBC Chapter 16 requirements, but not less than 20 PSF.
3. Seismic: Comply with 2022 CBC requirements for ground motion, soil profile, Seismic Use Group and site specific conditions identified in documents incorporated by reference on sheet S0.01.
4. Deflection:
   a. Vertical Framing: When exposed to 0.7 times required total of gravity, wind, lateral and dead loads; Less than l / 600 at framing supporting precast concrete or masonry assemblies and l / 360 for framing supporting metal cladding and fenestration but in no case shall total deflection exceed 0.3 inch.
   b. Horizontal Framing for Ground Level Ceilings Indicated on A 120: Limit deflection to Less than l / 240 but in no case exceeding 0.75 inch for load conditions required.
   c. Ceiling support assembly shall brace masonry walls against lateral forces including but not limited to seismic forces and provide a diaphragm load path to the masonry walls.

2.2 METAL FRAMING

A. Provide manufacturer's standard steel runners (tracks), blocking lintels, clip angles, shoes, reinforcements, fasteners, and accessories as recommended by manufacturer for applications indicated, as needed to provide a complete metal framing system for each type of framing required.

B. Metal Framing Components: Cold formed, not less than 18 gage, provide heavier gages where required; ASTM A 1003 structural quality steel sheet; with ASTM A 653 G90 galvanized coating [zinc or equivalent zinc-aluminum alloy] having salt spray resistance per ASTM A 1004 not less than 250 hours; products with a secondary coating are not acceptable.
   1. Studs: ASTM C 955; Manufacturer's standard load-bearing "C"-shaped 14 and 16 gage steel studs of with 1.625" flange and flange return lip unless otherwise indicated; stud size and interval indicated.
   2. Tracks: Manufacturer's standard C-shape sections of size indicated, 14 and 16 gage components as indicated.
   3. Joists: Manufacturer's standard C-shape sections of size, shape, and gage indicated.
   4. Furring: Z Furring and Z Purlin conforming to ASTM C 955
   5. Edge-of-Slab Stud Clips: Cold-formed galvanized steel; DriftClip® DSLB by the Steel Network Inc., California Metal System, Inc. or equal.

C. Accessories:
   1. Track Gasket: Compressible, closed-cell strip of polyethylene or polystyrene to isolate metal track from concrete slab; Ownes Corning FoamSealR, Dow Sill Gasket, or equal. Gasket at fire rated partitions shall comply with Section 07 84 00 Firestopping requirements.

2.3 FABRICATION

A. When factory prefabrication of framing components into panels prior to erection is provided such work shall be plumb, square, true to line and braced against racking and damage due to handling and erection. Assembly shall comply with requirements for field-constructed work and shall have welded joints throughout unless other type of connection is required. Prevent damage to prefabricated panels during handling and installation.

B. Fastenings: Weld similar components; mechanically fasten or weld dissimilar components as standard with fabricator. Wire typing is not acceptable.

PART 3 - EXECUTION

3.1 PREPARATION

A. Metal Framing Systems: Approved submittals, ASTM C 1007, and manufacturer's recommendations, unless otherwise indicated. Coordinate installation with supporting structure, deck and slab edges, inserts, imbeds, anchors, supplementary framing, and blocking to develop full strength of metal framing system, and comply with Project requirements.
   1. Furnish inserts and imbeds to other trades for installations well in advance of time needed for coordination with other work.

B. Runner Tracks: Continuous sized to match studs, accurately align base and top of studs.
   1. Anchors: 24 inches center-to-center spacing for nail or powder-driven fasteners, 16 inches center-to-center for other types, and at corners and ends. Anchor tracks as recommended by manufacturer's for type of construction involved,
   2. Provide track gasket to isolate metal framing from concrete slab to prevent corrosion. At fire rated assemblies comply with Section 07 84 00 Firestopping requirements.

C. Studs: Plumb, unless otherwise indicated and as needed for diagonal bracing. Secure studs to top and bottom runner tracks at both inside and outside flanges; provide deflection head where shown.
   1. Edge-Of- Slab: Provide Drift Clips as specified and as shown on the Drawings.

D. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure unless otherwise indicated.
   1. Openings: Provide double stud at each jamb of openings larger than 2 square feet, except where more than 2 are recommended by manufacturer. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall.
   2. Frame both sides of expansion and control joints, with separate studs; do not bridge the joint with components of stud system.
   3. Install horizontal stiffeners in stud system, spaced (vertical distance) at not more than 54 inches on center. Weld at each intersection.

E. Supplementary Framing, Blocking and Bracing: Provide where walls are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition.
   1. Blocking and Continuous Backing: 6-inch, 16 gage "C" stud at 24, 48 and 72 inches above finish floor unless otherwise required.
   2. Blocking and Continuous Backing: Provide studs and plate as indicated on A### and elsewhere on the drawings.
   3. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.

F. Joists: Level and plumb, braced as indicated with not less than 1.5-inch end bearing.
   1. Reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, or as otherwise recommended by joist manufacturer.

2. Joist Reinforcing at Supports: As indicated and as recommended by joist manufacturer.
3. Secure joists to interior support systems to prevent lateral movement of bottom flange.

G. Ceiling Support Assemblies on Ground Level: Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting walls and to restrain bottom flange of joists from lateral movement.
1. Provide headers at openings of joist and joist track, nesting joists, or other acceptable combination of connected joists.
2. Install bridging at joist ends and at intervals required; weld or mechanically attached to joist flange or webs per approved design. Bridging shall be cold-rolled steel channel, joist-track solid blocking, steel sheet straps or combination.
3. Provide miscellaneous framing, stiffeners, closure pieces, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

H. Deflection Heads and Movement Joints: Provide as indicated and as necessary for normal movement of structure in accordance with manufacturer's recommendations.

I. Field Repair of Shop-Applied Coatings: provide same coating system as used for shop applied work or an approved remedial system of the same manufacturer and prepare surfaces as necessary for remedial work.
1. Galvanizing: ASTM A 780, provide uniform protection in the repaired work.

END OF SECTION

SECTION 05 50 00 METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes metal fabrications not part of structural steel or other metal systems specified elsewhere, as indicated and scheduled.

B. Related Sections.
   1. Section 03 30 00 Cast in Place Concrete.

1.2 SUBMITTALS

A. Product Data: Manufacturer's specifications, and installation instructions for products used in Work of this Section.

B. Shop Drawings: Plans, elevations, structural calculations, field measurements, and details of sections, anchorages and accessories.
   1. Engineer's Stamp: Required on shop drawings and calculations.
   2. Templates: Provide for installation of anchors and bolts.
   3. Provide certification that galvanizing facility has equipment of sufficient size and capacity to comply with requirements for exposed galvanized steel components.

C. Samples: Two sets of materials and manufactured products used in Work of this Section.

D. Certificate of welding operator qualification.

1.3 QUALITY ASSURANCE

A. Qualifications:
   1. Engineer: Licensed professional in State where project is located.
   2. Welding Process and Operator: AWS D1.1, D1.2, and D1.3, AWS Code for manual shielded metal-arc welding, and remedial work.

B. Certify welding operators have passed AWS qualification tests.

1.4 PROJECT CONDITIONS

A. Field Measurements: Made prior to preparation of shop drawings, verify dimensions indicated, coordinate fabrication and construction schedules to avoid delay.

1.5 SEQUENCING AND SCHEDULING

A. Prevent delays, coordinate with other trades delivery and installation of anchors, inserts, and finished Work. Provide setting drawings, templates, and instructions for installation of items built into other assemblies.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Smooth, free of surface blemishes, pitting, seam marks, roller marks, and rolled trade names, Class, Grade, coatings and finish as indicated, unless otherwise required.
1. Plates, Shapes and Bars: ASTM A 36.
2. Bar Grating: ASTM A 569, and ASTM A 36.
3. Tubing: Cold formed, ASTM A 500; hot rolled, ASTM A 501.
4. Structural Sheet: Hot-rolled, ASTM A 1011; cold-rolled ASTM A 1008, Grade A.
5. Pipe: ASTM A 53; Schedule 40, Type and grade required for design loading, and fabrication process; black finish.
6. Castings: Gray Iron ASTM A 48, Class 30; Malleable Iron Castings ASTM A 47, Grade 32510; carbon Steel Castings ASTM A 27, Grade 70-36, Class 1.
7. Wire: ASTM A 510.

B. Aluminum Metals: Alloy specified unless otherwise indicated or required for application.
1. Sheet and Plate: ASTM B 209, alloy 5052-H32.
2. Extruded Bar: ASTM B 221, alloy 6061-T6.
3. Drawn Seamless Tube: ASTM B 210, alloy 6061.

C. Grout: As specified in Section 03 30 00.

D. Concrete: As specified in Section 03 30 00.

2.2 MANUFACTURED UNITS

A. Fasteners: Type, grade and class required, same metal as material fastened, except provide stainless steel fasteners for aluminum connections. Provide ASTM B 633 Class Fe/Zn 5 fasteners for exterior use, and fasteners in exterior walls except where stainless steel is required.
1. Steel Bolts and Nuts: ASTM A 307, Grade A, hexagon head, ASTM A 563.
2. Lag Bolts: ASME B18.2.1.
3. Machine Screws: ASME B18.6.3
4. Wood Screws: ASME B18.6.1, flat head unless otherwise required.
5. Anchor Bolts: ASTM F 1554, Grade 36, galvanized where required.
6. Threaded and Wedge Type Concrete Anchors: ASTM A 47malleable iron, ASTM A 27 cast steel with bolts, washers, and shims as necessary; hot-dip galvanized all components per ASTM A 153.
7. Expansion Anchors: Interior applications provide zinc plated carbon steel complying with exterior fastener requirement. Exterior applications provide ASTM F 593 stainless steel bolts and ASTM F 594 stainless steel nuts.
8. Plain Washers: ASME 18.22.1, carbon steel, round.
9. Lock Washers: ASME B18.21.1, carbon steel, helical spring.
10. Self-tapping/driving resistant to hydrogen embrittlement with tip and leading threads hardened to HRC 52 and shaft hardened to less than HRC 34 and complying with SAE J429 Grade 5 and ASTM A449 for strength and ductility. Provide fastener types, size, length and thread configuration necessary for each Project application and complying with ICC-ES Report for fastener performance characteristics. Screws: Corrosion preventing polymer coated, steel with hex washer head and bonded neoprene gasket, size and length per ICC-ES report and as required for Project specific applications. Organic polymer coating shall have a salt-spray resistance to red rust of more than

800 hours per ASTM B 117. ITW Buildex; Teks Maxiseal with Climaseal finish Textron Inc., Textron Fastening Systems; Elco Dril-Flex with Stalgard finish or approved.

B. Brackets, and Flanges: Same metal, type, and finish as supported member.

C. Woven Wire Cloth: Comply with ASTM E 2016 for patterns and configurations required.

2.3 FABRICATION

A. Shop Assembly: Required, minimize field assembly, disassemble only as necessary due to limitations of shipping and handling; mark units for reassembly and installation.

B. Material Size and Thickness: As indicated and required for strength and durability in finished product for use intended. Use structural steel shapes, plates and bars, unless otherwise required.

C. Form Work true to line and level with accurate angles and surfaces and straight sharp edges. Radius exposed edges approximately 1/32 inch unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners, joints, and seams continuously. Comply with AWS standards. Grind exposed welds smooth and flush; match adjoining surfaces.

E. Provide continuously welded joints where indicated, at joints exposed to view in completed work, and in assemblies exposed to weather, unless otherwise acceptable. Where welds are not required join components by mechanical means, concealed from view at visible joints.
   1. Mechanical Joints: Tight abutting surfaces with flush transition between them, uniform in profile and appearance.
   2. Exposed Fasteners: Countersunk and contoured for heads to be flush to adjacent surface when installed; provide Phillips, Allen or tamper resistant heads as directed.
   3. Joints Exposed to Weather: Resistant to intrusion of water. Provide water-tight continuously welded joints unless otherwise required. Weep and ventilate assemblies that are not water-tight in a manner that will limit water penetration and prevent entrapment of water within the assembly.

F. Provide brackets, flanges, fittings, and anchors of type and spacing as necessary; coordinate with supporting structure.
   1. Work Set in Concrete and Masonry: Galvanized and sleeved as necessary to prevent corrosion. Furnish inserts to be installed in concrete and masonry in coordination with work sequence and schedule.
      a. Sleeve: Steel pipe or tube, 6 inches long and 0.5-inch ID oversize; hold top of sleeve 0.5 inch below concrete surface, close bottom with 1-inch oversized plate.

G. Cut, reinforce, drill and tap metal fabrications for penetrations, and to receive hardware, anchors, and attachments.

H. Rough Hardware: Custom fabricated miscellaneous steel and iron shapes, bolts, plates, anchors, hangers, and dowels; provide as indicated.
   1. Washers: Malleable iron for connections bearing on structural wood.

I. Loose Bearing and Leveling Plates: Flat, thickness, bearing, and anchorage required, for steel items bearing on masonry, and concrete.

J. Miscellaneous Framing and Supports: Items not part of structural steel framework; provide as necessary and required to complete work.

K. Elevator Ladders: Comply with ANSI A14.3 Safety requirements for fixed ladders. Where ASME A17.1 and / or CAL OSHA requirements diverge, the more stringent design and safety requirements shall apply.
   1. Rungs: Center inside rail, plug weld, and grind rail face smooth; provide non-slip surface on top of rung.
   2. Support: Top, bottom, and at 5 feet on-center interval.

L. Exterior Courtyard Gate: Provide fully welded, hinged gate panel frames with infill panels, cantilevered post gate supports, footing anchorage, hardware and finishes as required for manually operated, access-controlled swing gate(s) as shown in Drawing Plan, Elevation and details.
   1. Coordinate electrical work scope for low-voltage access control where indicated.
   2. Sizes: As indicated in Drawings.
   3. Frame: HSS in sizes and thickness indicated; provide mitered corners.
   4. Infill panels: Steel bar in sizes and thickness indicated, welded to frame as indicated.
   5. Gate hardware: Reference Section 08 71 00 for assigned Group.
   6. Finish: Apply Powder-coated finish to fully assembled, galvanized steel gates; color to match aluminum storefront system unless noted otherwise in Drawings.

M. Rooftop Mechanical Screen: Provide fully welded, cantilevered aluminum frame and panelized welded wire mesh as shown in Roof Plan, Section and Detail Drawings. Reference Drawing Sheets S0.41 and A721.
   1. Frame: Aluminum, Type 6061, provide members in sizes and at spacing indicated.
      a. Mechanical Frame posts are through-bolted to HSS 5 x 5 stub posts welded to structural steel roof framing.
      b. Provide Type 316 stainless steel bolts.
   2. Metal Panel: Basis of Design is McNichols Aluminum, Expanded Metal, flattened, alloy 3003-H14, ¾” No .081 (Heavy), 61% open panel, or as selected by Architect from available patterns.
      a. Panel Edge: U-Edging, Aluminum, alloy 3003-H14, 14-gauge; miter corners.
      b. Attachment: Aluminum Flat Bar, ¼” x 1” continuous, powder coated finish to match panel; predrill for ¼”-14 inch stainless steel hex washer head fasteners at 24 inches on center prior to finishing.
   3. Finishes:
      a. Frame: High Performance Paint System. Reference Section 09 96 00.
      b. Metal Panel, Trim and Hardware: Provide powder-coated finish to match Architect sample.
   4. Accessory Product
      a. Neoprene gasket: Closed cell neoprene sheet; provide in thickness to insure tight fit between HSS stub and 6x6 aluminum post interior.

2.4 FINISHING

A. Galvanizing: Required after fabrication for exposed and concealed components in exterior assemblies, such as shelf angles and similar supports, items in contact with concrete and as indicated.
   1. Iron and Steel Hardware: ASTM A 153.

2. Steel Shapes, and Assembled Products: ASTM A 123.
3. Structural Steel: ASTM A 123, Coating Grade 80.
4. Steel Sheet: ASTM A 653 G90 or equivalent.
5. Galvanized Components Exposed to View: Comply with ASTM A 384 for control of warpage and distortion of galvanized components. Galvanizing tank shall be of sufficient size to allow member to be fully coated in one immersion.
   a. ASTM A 653 G 210 galvanized components

B. Shop Painting: SSPC-PAL Specification No.1.
1. Surface Preparation: Exteriors (SSPC Zone IB): SSPC-SP6 Commercial Blast Cleaning; Interiors (SSPC Zone 1A): SSPC-SP3 Power Tool Cleaning.

C. Shop applied primers and finish coatings: compatible with specified field finishes and systems. Primers shall provide a sound foundation for field-applied topcoats.
1. Shop Primer for Ferrous Metal: Direct-to-metal, abrasion-resistant, rust-inhibiting barrier coat compatible with field applied finish specified in Section 09900.
2. Shop Primer for Ferrous Metal: Fast-curing, lead-free, abrasion-resistant, rust-inhibiting complying with performance requirements only of FS TT-P-86, Types I, II, and III.
3. Galvanizing Repair Paint: Military Specifications MIL-P-21035, or SSPC-Paint-20.
4. Shop Prime for Galvanized Steel: One coat of two-component, polyamide epoxy 4.0 to 6.0 mils dry film thickness, VOC content less than 150 grams per liter, PPG Pitt-Guard 97-145.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Installer shall examine conditions for installation of Work and notify Contractor of conditions detrimental to proper and timely completion. Do not proceed until unsatisfactory conditions are corrected. Start of installation interpreted as installer's acceptance of conditions.
1. Coordinate work of this Section with field conditions to ensure proper fit with actual constructed assemblies. Provide clearances necessary for proper operation of moving parts and equipment and as necessary for servicing and maintenance of adjacent work.

3.2 INSTALLATION

A. Set Work accurately in location, and elevation; align, plumb, level, true and free of rack, measured from established lines and levels. Cut, drill, and fit as necessary for required installation. Brace, support, and anchor Work during installation as necessary.
1. Elevator Hoist Beam: Center over rails and to permit rigging as required by Elevator Code; coordinate with Section 14 21 00.

B. Align connections accurately, form tight hairline joints. Unless otherwise required, weld connections which could not be shop welded due to shipping limitations. Grind exposed joints smooth and touch-up shop finish. Do not weld, cut or abrade units intended for bolted, and screwed field connections.

C. Properly secure Work to in-place construction, use lead expansion shields for anchors in masonry and concrete walls. Provide flanges, collars, and sleeves to conceal joints, and as required. Use concealed anchors unless otherwise indicated.

D. Install Work in accordance with product manufacturer's recommendations unless otherwise indicated. Fit rails, guards, and gratings around building structure, mechanical systems, and permanent obstructions.

E. Grouting: Place in accordance with manufacturer's instructions. Remove bond-reducing contaminants from bearing surfaces and roughen to improve bond. Support loose plates on wedges, or shims cut-off flush with plate edge before grouting. Pack grout solidly into annular spaces, and between bearing surfaces, ensure that no voids remain.

F. Comply with recommendations of NAAMM Metal Bar Grating Manual for installation, clearances, and anchoring of gratings.

G. Repair of Shop Applied Coatings: Immediately after erection, prepare field welds, and damaged areas of shop applied coatings, and recoat with material originally used. Comply with Section 09 91 13, 09 91 23 and 09 96 00 requirements for preparation and application and coordinate with filed applied finishes.

END OF SECTION

SECTION 05 51 00 – ARCHITECTURAL METAL STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for Architectural Metal Stairs at Lower and Main Levels, as indicated on A001 and elsewhere on the drawings.

B. Related Sections:
1. Section 05 52 00 Metal Guards and Railings.
2. Section 05 52 13 Glazed Guards.
3. Section 05 50 00 Metal Fabrications.
4. Section 09 66 00 Terrazzo Flooring.
5. Section 21 13 00 Fire Suppression Sprinkler Systems.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Provide for advance coordination for work of this Section with building structure for required connection and support and work of related Section as necessary to ensure compliance with System Description requirements. Prevent the need for subsequent modifications to completed work of this Section and work of the Related Sections.
1. Provide coordination of steel fabrication work of this Section with guardrail assemblies of Section 05 52 00, finish stainless steel cladding assemblies of Section 05 50 00 and precast terrazzo treads and landing platforms of Section 09 66 00.

1.3 SUBMITTALS

A. Product Data: Provide the following; when requested provide additional data for materials and manufactured products proposed for use in the Work;

B. Shop Drawings: Plans, elevations, structural calculations, field measurements, and details of sections, anchorages and accessories for stairs. Indicate coordination provisions for subsequent attachment of guardrail assembly, terrazzo fabrications and stainless-steel cladding. Include structural calculations and stamp of registered Engineer for Contractor designed Work.
1. Indicate dimensional tolerances for coordination with work of Related Sections and verify completed assembly compliance with dimensions and tolerances required for the Work.
2. Indicate erection aids, locations, method of attachment and subsequent removal following erection.
3. Coordination with components embedded in cast-in-place concrete and connections at building structure.
4. Coordination with sprinkler piping location, support from stair structure and routing.

C. Erection Plan: Indicate Contractor's sequence, means and methods including but not limited to temporary support and bracing, erection aids - type and locations proposed. The Plan is required only to demonstrate compliance with requirements to plan the work and compliance with requirements for installed stair assembly.

D. Certificates: Welding operator qualification.

1.4 QUALITY ASSURANCE

A. Welding Processes and Operator Qualifications: AWS D1.1, D1.2, and D1.3, AWS Code for manual shielded metal-arc welding, and remedial work. Certify welding operators have passed AWS qualification tests.

B. Fabricator: Participant in the AISC Certification program and is designated an AISC Certified Plant, Category STD; alternative means of demonstrating qualifications for control of appearance in the work including but not limited to work samples may be acceptable as required for Substitutions.

C. Coating Applicator: Staff of craft-workers who are SSPC Interim Status Certification as a Coating Application Specialist or AISC Certification for shop application of Complex Protective Coating Systems. or other acceptable SSPC certification demonstrating the necessary skill and experience who will be assigned to work of this Project as a supervisor or applicator of the coating systems required.

1.5 SYSTEM DESCRIPTION

A. Design Requirements: Comply with NAAMM Metal Stair Manual for Architectural Class assembly in configuration required for connection and support from primary building structure and to comply with requirements of Related Sections for glazed guards, precast terrazzo treads and architectural cladding.
   1. Stair Treads, and Landing Platforms: Completed assembly shall provide for support and connection of precast terrazzo treads, glazed guards and architectural metal cladding work as required for work of these Related Sections.
      a. Terrazzo Treads: Coordinate with Section 09 66 00 for precast stair treads and ensure required connection and support of treads.
   2. Glazed Guards and Handrails: Coordinate with Section 05 52 00 and ensure stair structure provides necessary attachment and support of loads imposed by guard assembly per System Description requirements of that Section.
   3. Coordinate stair structure fabrications and final assembly to comply with S0.01 and S0.02 and as otherwise required for the Work.
   4. Dimensional Uniformity: Comply with CBC Title 24, Part 2 Volume 1 Section 1009 and 1011 for stairways and Sections 1014 and 1015 for railings and guards.
   5. Fire Suppression Sprinklers: Final design of stair assembly shall provide for support of and fully concealed service pipe and locations of sprinkler heads as necessary for required coverage in coordination with finish cladding and as otherwise directed by the Architect.
   6. Stainless Steel Cladding: Coordinate with work of Section 05 50 00 for supplemental support components and final installation of architectural finish fabrications fully enclosing stair structure and glazed guard base shoe as required.

B. Performance Requirements: Primary stair
   1. Stair Treads and Landing Platforms: Comply with live and concentrated load requirements of CBC Title 24 Part 2 Volume 2 Section 1607 and as otherwise necessary for connection and support of precast terrazzo treads.
   2. Glazed Guards and Handrails: Coordinate with work of Section 05 52 00 and provide support and attachment of assemblies to ensure compliance with Performance Requirements of that Section.
   3. Allowable Deflection: Comply with CBC Title 24 Part 2 Volume 2 Section 1604.3.

1.6 MATERIALS

A. Steel: Smooth, free of surface blemishes, pitting, seam marks, roller marks, and rolled trade names, Class, Grade, coatings and finish as indicated, unless otherwise required.
   1. Plates, Shapes and Bars: ASTM A 36.
   2. Tubing: Cold formed, ASTM A 500; hot rolled, ASTM A 501.
   3. Structural Sheet: Hot-rolled, ASTM A 1011, Designation CS; cold-rolled ASTM A 1008 Designation CS.

B. Bolts, Fasteners and welding materials in accordance with approved Shop Drawings.

C. Expanded Metal: Flattened, hot rolled, mill finished, carbon steel 3/4 No. 9 diamond mesh, 0.923 Short Way of Design by 2.1 inch Long Way, 71 percent open area.

1.7 FABRICATION

A. Shop Assembly: Required, minimize field assembly, disassemble only as necessary due to limitations of shipping and handling; mark units for reassembly and installation.

B. Material Size and Thickness: As indicated and required for strength and durability in finished product for use intended. Use structural steel shapes, plates and bars, unless otherwise required.

C. Form Work true to line and level with accurate angles and surfaces and straight sharp edges. Radius exposed edges approximately 1/32 inch unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners, joints, and seams continuously. Comply with AWS standards. Provide uniform size and profile in welds and coordinate joinery so as not conflict with finish cladding assembly and secondary supports.

E. Exposed Connections: Ensure the completed stair structure assembly will be fully enclosed by architectural cladding work of Section 05 50 00 including but not limited to portions of glazed guards indicated to be concealed.

F. Tolerance: Control and reduce deviations in dimensions from those indicated for the work and variations for like components in the final assembly to ensure required fit and appearance of the completed and finished stair and as necessary for incorporation of work of Related Sections having Architectural finish quality appearance.
   1. As a minimum, conventional tolerances shall be reduced by 30 percent for work of this Section.

1.8 SHOP PAINTING

A. Shop Prepare and Prime Steel Framed Stairs:
   1. Surface Preparation for Prime Paint: Comply with recommendation of the prime paint manufacturer for formation of durable paint bond to substrate; SP-3 Power Tool Cleaning shall be the minimum unless otherwise acceptable.
   2. Prime Paint: Provide an approved direct to metal, corrosion inhibiting primer having a record of successful in-service performance.

PART 2 - EXECUTION

2.1 EXAMINATION

A. In preparation of shop drawings, verify in field dimensions for stair rise, run and configuration and support and connection conditions to building structure and all other dimensions that may affect the work. Coordinate data with shop drawings and fabrication to avoid need for field modifications to Work.

B. Installer shall examine conditions for installation of Work and notify Contractor of conditions detrimental to proper and timely completion. Do not proceed until unsatisfactory conditions are corrected. Start of installation interpreted as installer's acceptance of conditions.

2.2 INSTALLATION

A. Stair Assembly Erection: Exercise a high degree of craftsmanship and care in handling and installing appropriate to finish grade components. Use tools and methods that will minimize the potential of damage to these components and compromise installation of subsequent finish work. Protect installed work from damage during subsequent construction activities and damage from exposure to weather. Set Work measured from established lines and levels accurately in location, and elevation; align, plumb, level, true, and free of racking and movement. Cut, drill, and fit as necessary for required installation. Brace, support, and anchor Work during installation as necessary with neither damage nor alteration affecting subsequent work.

B. Align connections accurately, form tight joints and durable and stable connections. Provide welded and bolted connections as approved for field joints. Welds shall be ground and finished where they may otherwise impede subsequent work of glazed guards and finish cladding.

C. Connect stair structure to primary building structure and support to comply with System Description.

D. Immediately after erection, prepare field welds, and damaged areas of shop applied paint, and repaint with material originally used for shop painting.

E. Tolerances for Field Erection: Comply with requirements for shop fabrication and assembly.

END OF SECTION

SECTION 05 52 00 - METAL GUARDS AND RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for custom guard and handrail assemblies at stairs, open side of floors and other required locations.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Advance Planning and Coordination Procedures: Proactive for coordination of work of this Section with concrete work of Section [03 30 00 03 48 13], metal decking of Section 05 30 00 for guard support and connections at open side of floors, Section 05 50 00 for stair structure affecting guard connections and supports, and finish work. Ensure compliance with System Description and prevent the need for subsequent modifications to fabricated and installed work or Related Sections. Participation by all pertinent parties, including but not limited to Fabricator, Erector, Contractor and the design engineer for delegated design work.

B. Sequence and Schedule: Prevent trafficking of sensitive finish treatments on stair tread, risers and landings; delay application of finishes to prevent damage and wear without obstructing Project Schedule.

1.3 SUBMITTALS

A. Product Data: Provide the following; when requested provide additional data for materials and manufactured products proposed for use in the Work.

B. Shop Drawings: Plans, elevations, field measurements, details of sections, anchorage and accessories for guard assemblies. Document coordination for attachment of guard assembly to supports and integration with finishes. Include structural calculations, seal and signature of registered Engineer for design work delegated to the Contractor.

C. Samples: Provide three of each required for standard components of cable guardrail assemblies, custom guardrail stanchions, handrails and supports.
   1. Wire Mesh Guards: Provide wire mesh fabric, frame, fittings, tension rod and all hardware necessary for complete installation; wood top rail in profile, milled for continuous concealed flat bar, in species and finish indicated.
   2. Finish Sample: For one set of stanchion-rail samples provide stepped demonstration of mill finish, prepared surface, shop primer and field applied finish, coordinate with section 09 91 13, 09 91 23 and 09 96 00 for finish painting, and mechanical finish on stainless steel handrail.

D. Certificates:
   1. Welding operator qualification.

E. Mock-Up: Provide complete, full-size guard and handrail assembly as required for the Work and configured for stair mock-up specified in Section 05 50 00. Mock-up assembly shall be complete with all fittings, hardware, components and finishes.

1.4 QUALITY ASSURANCE

A. Welding Processes and Operator Qualifications: AWS D1.1, D1.2, and D1.3, AWS Code for manual shielded metal-arc welding, and remedial work. Certify welding operators have passed AWS qualification tests.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Performance Requirements: Comply with barrier free access requirements of CBC Title 24 Chapter 11 and barrier free access requirements.
1. Handrails and Top rails: ASTM E 935; concentrated load: 200 foot-pounds applied in any direction; uniform load: 50 pounds per lineal foot applied concurrently vertically and horizontally normal to top rail.
2. Guardrails: Uniform load equivalent to 50 pounds per square foot of gross area of guard, including open areas; concurrent with top rail concentrated load for determining stress on supporting members.
3. Allowable Deflection: Comply with ICC Section 1604.3
4. Stress Due to Differential Loads: Accommodate to maintain specified performance requirements.

2.2 MATERIALS

A. Steel: Smooth, free of surface blemishes, pitting, seam marks, roller marks, and rolled trade names, Class, Grade, coatings and finish as indicated, unless otherwise required.
1. Plates, Shapes and Bars: ASTM A 36.
2. Tubing: Cold formed, ASTM A 500; hot rolled, ASTM A 501.
3. Structural Sheet: Hot-rolled, ASTM A 570, Grade 30; cold-rolled ASTM A 611, Grade A.

B. Stainless Steel: AISI Type 302/304, unless otherwise indicated.
1. Perforated Sheet: ASTM A 666; 14 Gage with 0.25-inch diameter holes, staggered on 0.375 inch centers, 40 percent open area having 0.5 inch wide blank margin on vertical edges. Orient perforations to align horizontally. Machine leveled to the following tolerances measured per ASTM A 505.
a. Flatness: 0.25 inch in any 36 inches.
b. Camber: 0.125 inch in any 48 inches.
c. Burrs: Not more than 0.003 inch maximum, do not reduce open area.
2. Tubing: ASTM A 554.
3. Plate: ASTM A 666.
4. Bar and Rod: ASTM A 276.

2.3 FABRICATION

A. Shop Assembly: Required, minimize field assembly, disassemble only as necessary due to limitations of shipping and handling; mark units for reassembly and installation.

B. Material Size and Thickness: As indicated, and required for strength and durability in finished product for use intended. Use structural steel shapes, plates and bars, unless otherwise required.

C. Form Work true to line and level with accurate angles and surfaces and straight sharp edges. Radius exposed edges approximately 1/32 inch unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners, joints, and seams continuously. Comply with AWS standards. Grind exposed welds smooth, and flush; match adjoining surfaces.

E. Exposed Connections: Welded to greatest extent possible, otherwise, use concealed fasteners where possible. Provide uniform, hairline-tight joints, flush and smooth.
1. Exposed Fasteners : Provide acorn type cap head nuts as required.

2.4 HAND AND GUARD RAILINGS

A. Guardrails and Handrails on Open Side of Floors: Comply with requirements for stair assemblies and configurations indicated. Coordinate height of sloped assemblies with horizontal assemblies to maintain required heights at transition points.
1. Guardrails and Handrails: Custom fabrication of stainless steel plate and bar, with hardwood or stainless steel hand and top rails and stainless steel wire mesh infill panels as indicated in Drawings. Provide assemblies in configuration indicated.
a. Anchor Screws: 18-8 stainless steel, 1 inch, Number 7, countersunk square Allen drive wood screw.
b. Concrete inserts: Per Drawings and approved Shop Drawings; coordinate high-strength, no- shrink setting material with Section 03 30 00.
c. Brackets: Provide in type and spacing as indicated in approved Shop Drawings.
2. Stainless Steel and Steel Tube Handrail: Configuration, pipe sizes, and wall thickness indicated, but not less than required to support design loading in minimum number of joints to provide lengths indicated.
a. Joints: Butt-weld, weld with internal connectors, cope, and miter as indicated
b. Bends and Curves: Uniform, maintain constant pipe cross-section free of deformation throughout bend. Form by bending pipe in jigs and with prefabricated fittings
c. Close pipe ends with 3/16-inch-thick steel plate, return railing to wall unless otherwise indicated.
3. Standards: Stainless steel bar welded to top rail. Control weldments for uniform width and minimum visibility. Plug weld rods to steel angle top rail and grind smooth on bottom face of horizontal leg.
4. Toe Boards: Provide only where indicated and as shown, but no less than 1/8-inch plate 4 inches high, center between and weld to each railing post.

B. Curved Sections: Formed to regular, uniform curve of required radius.

C. Tolerances: For fully assembled units, not additive to tolerances for components specified in this Section nor work of other Sections.
1. Total Deviation from Plumb: 0.125 inch in four feet.
2. Deviation From True Lines: 0.25 inch in ten feet.
3. Deviation From True Curve: 0.375 inch, radius ten feet and greater.
4. Variation in Joint Width: 0.0625 inch in 5 ft; 0.1875 inch in 15 ft.

2.5 ELEVATED WALKWAY GUARDS

A. Work Scope to be finalized in Site Walk and field review of existing elevated walkway with Owner, Architect and Contractor prior to Bid, and may include but is not necessarily limited to the following:
   1. Selective removal, restoration and refinishing of existing 3/8-inch stainless steel elevated walkway tie-rods installed at 7.5 inches on center.
   2. Replacement of deformed or corroded elevated walkway tie-rods as determined by Owner/Architect, retrofitting matching 3/8-inch stainless steel tie-rods at existing horizontal steel framing elements.
   3. Placement of new elevated walkway 3/8-inch stainless steel tie-rods to match existing at 7.5 inches inches on center.
   4. Replacement of hardware identified for replacement.
   5. Placement of new, continuous, woven stainless steel wire as shown in Drawing details, supported top and bottom, woven, affixed and tensioned as indicated. Basis of Design wire fabric is Cambridge Architectural Mesh, Rigid Mesh.
   6. All new and replacement hardware shall be Type [316] [304] stainless steel.

B. Completed guard assembly shall meet CBC Title 24 Part 2 Section 1015 and 1607.9 structural criteria.

2.6 SHOP PAINTING

A. Shop Priming and Field Finishing of Steel Framed Stairs: Comply with requirements of Section 05 12 00 for exposed structural steel and Section 09 90 00 for field applied finish.
   1. Surface Preparation for Prime Paint: SP-6 Commercial Blast Cleaning using only abrasive media blasting, wheelabrator and similar tools are not acceptable. Preparation shall not impart surface texture that cannot be covered by the prime paint application.
   2. Material and fabrication defects and unacceptable characteristics revealed by surface preparation such as weld imperfections, delamination, scabs and slivers shall be corrected before completion of surface prep and primer application.

B. Prime Paint: One coat of two-component, white, polyamide epoxy 4.0 to 6.0 mils dry film thickness, 375 grams per liter maximum VOC, two-component polyamide epoxy. PPG Pitt-Guard 97-145; ICI Devran 220; S-W Recoatable Epoxy Primer B67; Tnemec Series 27 F.C. Typoxy; provide products of one manufacturer for prime and finish paints. Shop prime prepared substrates immediately following surface preparation. Field finish paint per Section 09 90 00 requirements coordinate paint products to ensure compatibility.

C. Hot-Dip Galvanizing: Per ASTM A 123 Coating Grade 100; provide on members exposed to weather, including but not limited to members in masonry cavity walls. Prepare per SP-3 except as otherwise necessary to remove unacceptable characteristics from work exposed to view and as required for application of other shop coatings.
   1. Galvanized Components Exposed to View: Comply with ASTM A 384 control warp and other distortion of galvanized components. Galvanizing tank shall be of sufficient size to allow member to be fully coated in one immersion. Prepare galvanized components required to be painted as necessary to ensure the formation of a durable paint film.
   2. Comply with ASTM D 6386 requirements for preparation of galvanized surfaces to be painted and as otherwise necessary to ensure a durable paint bond.
   3. Galvanizing Repair Paint: SSPC-Paint-20.

D. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows:
   1. SP-1 "Solvent Cleaning".
   2. SP-2 "Hand Tool Cleaning".
   3. SP-3 "Power Tool Cleaning".
   4. SP-5 "White Metal Blast Cleaning".
   5. SP-6 "Commercial Blast Cleaning".
   6. SP-7 "Brush-off Blast Cleaning".

2.7 SHOP FINISHING

A. Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations, except as otherwise indicated.
   1. Stainless Steel: ASTM A 480 No. 4. non directional polish. No Satin Brush, No. &, finish a number 6 surface with Tampico brushing
   2. Welds: Ground smooth, polished and passivated for seamless appearance.

B. After fabrication, finish joints, and bends, and repair damaged finish to match sheet finish. Prevent damage to finished material with temporary covering or other acceptable protection.

C. Transparent Handrail Finish: Reference Section 09 91 23 Interior Painting for transparent wood finish requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to preparation of shop drawings, verify in filed dimensions indicated, coordinate with shop drawings and fabrication to avoid need for field modifications to the Work.

B. Installer shall examine conditions for installation of Work, and notify Contractor of conditions detrimental to proper and timely completion. Do not proceed until unsatisfactory conditions are corrected. Start of installation interpreted as installer's acceptance of conditions.

3.2 INSTALLATION

A. Set Work accurately in location, and elevation; align, plumb, level, true, forming constant radius or line, and free of rack when measured from established lines and levels. Cut, drill, and fit as necessary for required installation. Brace, support, and anchor Work during installation as necessary.

B. Align connections accurately, form tight hairline joints. Unless otherwise required, provide bolted connections for field joints. Exposed welds shall be ground smooth and flush and finished for seamless appearance; repair shop applied coatings. Do not weld, cut or abrade units intended for bolted, and screwed field connections.

C. Properly secure Work to in-place construction. Provide flanges, collars, and sleeves to conceal joints, and as required. Use concealed anchors unless otherwise indicated.
   1. Exposed bolts shall have acorn type cap head nuts - provide cap head as finish nut over structural nut where necessary to comply with structural bolting requirements.

Align facets of stacked nuts for uniform appearance, and coordinate application of cap nut with special inspections requirements.

D. Immediately after erection, prepare field welds, and damaged areas of shop applied coatings paint, and repaint with material originally used for shop painting. Provide dry film thickness of 2.0 mils.
   1. Galvanizing: Comply with ASTM A 780 and provide uniform appearance in the repaired work.

E. Finish Painting: Field applied per Section 09 90 00 requirements.

3.3 FIELD QUALITY CONTROL

A. Hand and guardrail assemblies are subject to evaluation by the Owners Quality Control Agent per ASTM E 894 Test Method for Anchorage and E 935 Test Methods for Railing Systems.
   1. Owner may elect to have a representative sampling of each type of railing, cantilevered, wall mounted tested as necessary to verify compliance with Contract requirements.

END OF SECTION

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for rough carpentry, and incidental carpentry for support or attachment of other work.

B. Related Sections:
1. Section 06 20 00 Finish Carpentry.
2. Section 06 40 00 Architectural Woodwork.

1.2 SUBMITTALS

A. Product Data: Manufacturer's product literature for fasteners, vapor barrier tape, building paper, sheathing, wood preservative materials, and application instructions.
1. Certifications: Demonstrate compliance with Quality Assurance, requirements.
2. Compliance with Local / Regional Materials requirements.
3. Schedule of Values Documentation: Added cost, if any, for sustainably sourced wood products. Value-added as a result of shop fabrication of certified wood products.
4. Document Chain of Custody from forest of origin through manufacturing and fabrication. Include certified status and location of forest of origin and location of manufacture (mill).

B. Evaluation Reports: ICC-ES Report with applicable Legacy ICBO Evaluation Report and Legacy NES Report Number for each type of fastener.

1.3 QUALITY ASSURANCE

A. Evidence of Grade: Conform to California Building Code Chapter 23 and DOC PS 20-20.
1. Rough Lumber: Stamp each piece of lumber and plywood with grade mark and trademark of Association having jurisdiction.
2. Acceptable Lumber Inspection Agencies: Any agency with rules approved by American Lumber Standards Committee.

B. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

C. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

D. Moisture Content:
1. Certify that lumber and wood panels (surface dry, surface green, and kiln dried) contain no more than 15 percent moisture content when delivered to site.
2. Monitor moisture content of in-place wood and take remedial action to lower unacceptable moisture content.

E. Foreman Qualifications: Fifteen years successful experience with Work similar to that required for this Project, especially work involving exposed wood structure. The last three

years of their experience shall be with the firm they are presently working for. This foreman shall have authority to direct the work of this Section and shall be on site at all times work of exposed wood structure is in progress.

1. Certification of Qualifications: Five recent jobs similar to this Project, include project and contact name, location, and date.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store wood materials a minimum of 6 inches above ground on framework or blocking, away from dirt and moisture, well ventilated, and covered with waterproof covering.

B. Delivery Storage and Handling: Keep materials dry, and prevent exposure to weather; store in orderly, well-ventilated stacks. Conform to chain of custody requirements as necessary to maintain FSC certification.

1.5 COORDINATION

A. Coordinate rough carpentry of this Section with other Sections to make Work fit together.

B. Coordinate with other Sections for work mounted to or supported by wood framed assemblies provided as work of this Section.

PART 2 - PRODUCTS

2.1 LUMBER

A. Lumber Grading Rules: WWPA or WCLIB based on DOD PS 20.

B. Structural Lumber and Timber: Conform to Structural Drawings for wood framed construction subject to structural loading, including maximum allowable moisture content.

C. Non-Structural Framing Lumber: Include wood framed construction and components not subject to structural loading as defined by Structural Drawings.

1. Species: Douglas Fir-Larch.
2. Grade: WWPA or WCLIB, No. 2.

D. Condition of Seasoning (Moisture Content):

1. Nominal 2-inch Thickness: S-DRY, 15 percent maximum moisture content.
2. Nominal 4-inch Thickness or Greater: S-GRN. Air dry to 19 percent maximum moisture content.

2.2 WOOD PANEL PRODUCTS

A. General: APA Grade Stamp each panel. Conform to DOC PS 1 and DOC PS 2 for cross laminated veneer panel.

1. APA A-A Group 1, Exposure 1: Where face exposed both sides.
2. APA PS 1, A-D Group 1, Exposure 1: Face exposed one side.
3. APA PS 1, C-D Plugged Group 2, Exposure 1: Face unexposed.

4. APA, Exterior: Provide in lieu of Exposure 1 where panels are subject to permanent weather exposure or prolonged weather exposure of 6 months or more prior to being covered with weathertight construction.

B. Wall Sheathing: APA Plywood Rated Sheathing Exposure 1 or APA Structural I Rated Sheathing Exposure 1, 15/32 inch thick, except as otherwise shown on Structural Drawings.
1. Joints: Square edge.
2. APA Span Rating: Not less than Index 32/16.

C. Equipment Mounting Panels: Fire-retardant treated, APA C-D PLUGGED INT with exterior glue, 0.5 inch thick unless otherwise indicated.

2.3 ENGINEERED WOOD PRODUCTS

A. Structural Composite Lumber: Establish and monitor structural capacities conforming to ASTM D5456 required by CBC 2303.1.9 and as specified by the Structural Notes.

B. Structural Laminated Veneer Lumber (LVL): Trus Joist, Microllam, and as specified by the Structural Drawings.

C. Parallel Strand Lumber (PSL) Beams: Trus Joist, Parallam, for use in lieu of glue-laminated lumber at conditions not exposed to view and as specified by the Structural Drawings.

D. Laminated Strand Lumber (LSL): Trus Joist Timberstrand, accepted in lieu of dimensional lumber, and as specified by the Structural Drawings.

2.4 FASTENERS

A. Fastener Types, Sizes, Spacing, and Quantities: Provide fasteners and connectors including nails, spikes, screws, clips, bolts, and anchors required for installation of carpentry and millwork, conforming to CBC Table 2304.9.1, APA recommendations, and as shown on Structural Drawings.
1. Provide stainless steel or coated components specifically intended for use in corrosive environments and the specific type of preservative treatment incorporated into the wood.

B. Steel Drill Screws:
1. ASTM C1002, self-drilling, minimum 1-1/4-inch long, bugle head, corrosion-resistant polymer coating, conforming to ASTM B117.
2. Screws at Steel Framing: Type S, in lengths required to penetrate 3/8 inches beyond steel stud framing.

C. Nails, Spikes, Staples and Other Driven Fasteners: Conform to ASTM F1667 and CBC Section 2303.6.

D. Bolts and Lag Bolts: Conform to ASTM A307. Provide steel plate washers.

E. Metal Connectors: Simpson Strong-Tie Company or approved equivalent. Types indicated on drawings with minimum G-90 zinc coating.

2.5 ANCHORS

A. Conform to Structural Drawings, manufacturer's ICC ES Evaluation Reports, and manufacturer's instructions, including manufacturer's tables indicating design loads and recommended use for each fastener type.

B. Concrete Anchors:
1. Drive Anchors: As specified by the Structural Notes.
2. Expansion Anchors: As specified by the Structural Notes.
3. Adhesive Anchors: As specified by the Structural Notes.

C. Steel Anchors: Powder actuated fasteners or threaded bolts, nuts, and washers as indicated by the Structural Drawings and manufacturer's instructions.

D. Floor Plate and Sill Anchors: Conform to CBC Sections 2308.3.3, 2308.3.8, 2308.12.9, and to the Structural Drawings.
1. 5/8 galvanized steel bolts or approved anchors embedded minimum 7 inches into concrete and spaced as indicated on the Structural Drawings.
2. Provide at least 2 bolts or anchor straps at each plate located not more than 12 inches and not less than 4 inches from each end.
3. Bolt and tighten plate to foundation with nut and washer.

E. Bar or Strap Anchors: Conform to the Structural Drawings.

2.6 ROUGH HARDWARE

A. Framing Anchors, Beam, and Post Connectors: Designed to support imposed loads, conforming to the Structural Drawings.

B. Joist and Rafter Hangers: Conform to CBC Section 1715, as tested according to ASTM D1761, for vertical load-bearing capacity, torsional moment capacity, and deflection characteristics and as specified by the Structural General Notes.

2.7 ACCESSORIES

A. Construction Adhesives: Solvent based, conforming to APA Specification AFG-01, with maximum VOC based on current requirements of South Coast Air Quality Management District (SCAQMD) Rule No. 1168 on the interior of the building.
1. "Current requirements" refers to the date on which the materials are installed in the building.
2. Follow SCAQMD Rule No. 1168. Refer to http://www.aqmd.gov/rules for the actual current version of the rule that will be applicable at the date of installation during construction.
3. "Interior" refers to all building construction that is inside of the exterior weatherproofing material.

B. Sill Seal: Foam gasket and self-adhering membrane: Triple Guard Energy Sill Sealer by Protecto Wrap, or approved.

2.8 FINISHES

A. Carbon Steel Fasteners, Anchors, Straps, and Rough Hardware: ASTM A123 or ASTM A153, hot-dip galvanized.
   1. Exterior carbon steel in contact with concrete, G90. Stainless steel also is acceptable.
   2. Interior steel, G40 in dry conditions, G60 where subject to wetting. Stainless steel also is acceptable.
   3. Fasteners Placed in Chemically Treated Wood: Steel or coated components specifically intended for use with chemically treated wood products being incorporated into the Work.

B. Stainless Steel Fasteners and Anchors: ASTM A276 Type 316.

C. Electrolysis Protection: Isolate metal in contact with metals of dissimilar galvanic range by isolation methods including application of suitable primers, paints, or tapes.

2.9 WOOD TREATMENT

A. Wood Preservative (Pressure Treatment):
   1. Apply preservative treatment to all exterior lumber, including roofing nailers, curbs, and other wood in contact with concrete, and moist conditions.
   2. For above-ground use, use AWPA certified Ammonium Copper Quaternium (ACQ) or Copper Hydroxide Sodium Dimethyldithiocarbamate (CDDC) waterborne preservative with 0.25 pounds per cubic foot of wood retention.
   3. Approved Product: "Wolmanized Natural Select" by Arch Wood Protection, Inc. (Smyrna, GA; 770-801-6600); copper azole (CA) fungicide.
   4. For ground-contact use, use AWPA Treatment C-22 using CCA waterborne preservative with 0.40 pounds per cubic foot of wood retention.
   5. Treated lumber shall be kiln dried to a maximum moisture content of 15 percent; treated plywood shall be kiln dried to a maximum moisture content of 15 percent.
   6. Treated lumber shall bear the quality stamp of an inspection agency approved by the jurisdictional code authorities.

B. Isolation Membrane: Self-adhering non-asphalt based, breathable, waterproof membrane, GCP Applied Technologies Perm-A-Barrier VPS or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify conditions ready to receive work of this Section before beginning. Notify the Owner in writing of conditions detrimental to the proper and timely completion of the work. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

B. General:
   1. In addition to framing operations normal to the fabrication and erection indicated on the drawings, install wood blocking and backing required for the work of other trades.
   2. Set horizontal and sloped members with crown up.

3. Do not notch, cut, or bore members for pipes, ducts, or conduits, or for other reasons except as shown on the drawings or as specifically approved in advance by the Engineer of Record.
4. The contact surfaces of any member coming in contact with an exterior concrete regardless of height above ground shall be treated wood or shall be painted with two coats of an approved preservative.
5. Wood Products with Chemical Treatment: Material shall be separated from contact with other materials by continuous layer of the specified isolation membrane applied to all contact surfaces.

3.2 INSTALLATION

A. Conform to APA Design/Construction Guides, California Building Code 51-50 Chapter 4, and the Structural Drawings.
1. Sill Gaskets: Provide two contiguous lines of specified product at sills of exterior walls and seal against air infiltration and water penetration.
2. Chemically Treated Wood Products: Material not certified by the manufacturer as compatible with contact surfaces and substrates shall be separated from contact with other materials by contiguous layer of the specified isolation membrane applied to all contact surfaces.

B. Cants, Curbs, and Nailers: Pressure treated; dimensions as indicated or required.

C. Fire Blocking: Construct nominal 2-inch-thick solid lumber at ceiling line. Construct at mid-height between studs, where partition height exceeds 8 feet. Do not exceed 10 feet on center vertical spacing.

D. Dressed Wood Grounds: Set for securing wood trim, base, and millwork. Install to be secure rigid, straight, true, and aligned.

E. Shims: Do not use shims for leveling on wood or metal bearings; cut and fit members accurately.

F. Wood Backing: Provide for secure installation and support of work of other Sections, including but not limited to casework, hardware, plumbing, heating, ventilating, and electrical work. Accepted for installation at metal stud partitions as well as for wood framing, except where not permitted by Code.

G. Structural nailing shall follow IBC Table 2304.9.1 unless more stringent requirements are indicated on the Structural Drawings.

3.3 WALL SHEATHING

A. Stagger panel ends per the Structural Drawings.

B. Nail to framing at exterior wall sheathing at 6 inches on center at panel edges maximum and 12 inches on center at panel field. Include additional fasteners as necessary to set securely in place.

C. Refer to the Structural Drawings for more stringent nailing requirements.

3.4 PANEL BOARDS

A. A. Provide panel boards and backings for support of Mechanical and Electrical work.
1. Use fire-retardant plywood for Electrical panel boards.
2. Oversize panel boards 12 inches beyond mounting requirements.

3.5 BLOCKING, NAILERS, AND CURBS

A. Provide blocking, nailers, and curbs for sheathing, roof construction, metal flashing, and other construction as indicated, and as necessary for firm support. Unless otherwise indicated, solid wood backing shall be a minimum 2-inch nominal thickness, installed flat.

B. Blocking: Install wood blocking to receive mechanical fasteners for support of plumbing and electrical fixtures and equipment, cabinets, door stop plates, wood base, wainscots, coat hooks, toilet and bath accessories, kitchen equipment, and all other wall- and ceiling-mounted components.

3.6 FASTENERS

A. Provide nails, spikes, screws, and bolts as necessary for secure and rigid permanent connections. Conform to CBC Table 2304.9.1-Fastening Schedule, APA recommendations, and provisions of the Contract Documents.

B. Provide stainless steel or coated components specifically intended for use in corrosive environments and the specific type of preservative treatment incorporated into the wood.

C. Anchors: Anchor plates, caps, and wood framing to other construction with anchors spaced 48 inches on center and with each item anchored with at least two anchors.

D. Drive nails perpendicular to grain of wood in lieu of toe nailing, where feasible.

E. Bolting: Drill holes 1/16 inch larger in diameter than bolts being used. Drill straight and true from one side only. Do not bear bolt threads on wood.

F. Screws: For lag screws and wood screws, pre-bore holes the same diameter as the root of threads, enlarging holes to shank diameter for length of shank.

G. Nailing:
1. Use only common wire nails or spikes of the dimension shown on the Nailing Schedule, except where otherwise specifically noted on the drawings. Sinker nails are not allowed.
2. For conditions not covered in the Nailing Schedule, provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike, provided, however, that 16d nails may be used to connect two pieces of 2-inch (nominal) thickness.
3. Nail without splitting wood.
4. Prebore as required.
5. Remove split members and replace with members complying with the specified requirements.

END OF SECTION

SECTION 06 16 00 – sheathing

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Parapet sheathing.
4. Composite nail base insulated roof sheathing.
5. Subflooring.
6. Underlayment.
7. Sheathing joint-and-penetration treatment.

B. Related Requirements:

1. Section [06 10 00 **"Rough Carpentry"**] [**061053 "Miscellaneous Rough Carpentry"**] for plywood backing panels.
2. Section 07 25 00 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5516.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.
2. Fire-retardant-treated plywood.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate marking of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WOOD PANEL PRODUCTS

A. Certified Wood: For the following wood products, provide material produced from wood obtained from forests certified by and FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.

B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

C. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D5516 and design value adjustment factors shall be calculated according to ASTM D6305. Span ratings after treatment shall be not less than span ratings specified.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency

E. Application: Treat plywood indicated on Drawings, and the following:

1. Roof and wall sheathing within 48 inches (1220 mm) of fire and party walls.
2. Roof sheathing.
3. Subflooring and underlayment for raised platforms.

2.5 WALL SHEATHING

A. Plywood Wall Sheathing: Either DOC PS 1 or DOC PS 2, Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 32/16.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

B. Oriented-Strand-Board Wall Sheathing: DOC PS 2, Exposure1, Structural I sheathing.

1. Span Rating: Not less than 32/16.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

C. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.

1. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick.
2. Size: 48 by 96 inches (1219 by 2438 mm) or 48 by 120 inches (1219 by 3048 mm) for vertical installation.

2.6 ROOF SHEATHING

A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 48/24.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

B. Oriented-Strand-Board Sheathing: DOC PS 2, Exposure1, Structural I sheathing.

1. Span Rating: Not less than 48/24.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

2.7 PARAPET SHEATHING

A. Plywood Wall Sheathing: Either DOC PS 1 or DOC PS 2, Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 32/16.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

B. Oriented-Strand-Board Wall Sheathing: DOC PS 2, Exposure1, Structural I sheathing.

1. Span Rating: Not less than 32/16.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

C. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.

1. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick.
2. Size: 48 by 96 inches (1219 by 2438 mm) or 48 by 120 inches (1219 by 3048 mm) for vertical installation.

2.8 SUBFLOORING AND UNDERLAYMENT

A. Plywood Combination Subfloor-Underlayment: DOC PS 1, Exposure 1, Structural I, Underlayment single-floor panels.

1. Span Rating: Not less than 24.
2. Nominal Thickness: Not less than 23/32 inch (18.3 mm).
3. Edge Detail: Tongue and groove.
4. Surface Finish: Fully sanded face.

B. Underlayment: Provide underlayment in nominal thicknesses indicated or, if not indicated, not less than 1/4 inch (6.4 mm) over smooth subfloors and not less than 3/8 inch (9.5 mm) over board or uneven subfloors.

1. Plywood Underlayment for Resilient Flooring: DOC PS 1, Exterior B-C Exposure 1 Underlayment with fully sanded face.
2. Plywood Underlayment for Ceramic Tile: DOC PS 1, Exterior, C-C Plugged, not less than 5/8-inch (15.9-mm) nominal thickness.
3. Plywood Underlayment for Carpet: DOC PS 1, Exposure 1, Underlayment.
4. Particleboard Underlayment: ANSI A208.1, Grade M-2, made without urea formaldehyde.

2.9 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof, parapet, and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with and evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C1002

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.

1. For steel framing less than 0.0329 inch (0.835 mm)(20 ga.) thick, use screws that comply with ASTM C1002.
2. For steel framing from 0.033 to 0.112 inch (0.84 to 2.84 mm)(20 ga. to 10 ga) thick, use screws that comply with ASTM C954.

2.10 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

2.11 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 or ASTM D3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Adhesives shall be compliant with California Department of Health Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1 (2010) or Version 1.2 (2017) (also known as Specification 01350).
2. Adhesives shall also meet the following VOC limits:
    a. Drywall and Panel Adhesive: 50 g/L.
    b. Multi-purpose Construction Adhesive: 70 g/L.
    c. Subfloor Adhesive: 50 g/L.
    d. Wood Substrate Adhesive: 30 g/L.
3. Follow more stringent local, regional, state and federal requirements where applicable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall, parapet, and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Combination Subfloor-Underlayment:
    a. Glue and nail to wood framing.
    b. Screw to cold-formed metal framing.
    c. Space panels 1/8 inch (3 mm) apart at edges and ends.
2. Subflooring:
    a. Glue and nail to wood framing.
    b. Screw to cold-formed metal framing.
    c. Space panels 1/8 inch (3 mm) apart at edges and ends.
3. Wall and Roof Sheathing:
    a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
    b. Screw to cold-formed metal framing.
    c. Space panels 1/8 inch (3 mm) apart at edges and ends.

4. Underlayment:

   a. Nail to subflooring.
   b. Space panels 1/32 inch (0.8 mm) apart at edges and ends.
   c. Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

3.3 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to wood framing with screws.
2. Fasten gypsum sheathing to cold-formed metal framing with screws.
3. Install panels with a 3/8 inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
4. Install panels with a 1/4 inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach panels at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach panels at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

E. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.4 CEMENTITIOUS BACKER UNIT INSTALLATION

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.5 PARTICLEBOARD UNDERLAYMENT INSTALLATION

A. Comply with CPA's recommendations for type of subfloor indicated. Fill and sand gouges, gaps, and chipped edges. Sand uneven joints flush.

1. Fastening Method: Glue and nail underlayment to subflooring.

END OF SECTION 06 16 00

SECTION 06 16 43 – GYPSUM AND CEMENTITIOUS SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for gypsum sheathing in exterior cavity wall assemblies and **cement board at select roof and canopy assemblies.**

B. Definitions: ASTM C 11.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Verify compatibility, application rate and all other installation requirements for air barrier assembly work of Section 07 25 13 for the specific gypsum sheathing panels being provided for the work.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data for cementitious materials, lath, metal support components, and accessories.

1.4 QUALITY ASSURANCE

A. Fire-Resistance Assemblies: Tested per ASTM E 119 and UL listed, or other acceptable agency, for rating required.

B. Delivery, Storage and Handling: GA-216, GA-800 for gypsum sheathing.

C. Coordinate with air barrier assembly work of Section 07 25 13; sheathing panels provided as work of this Section may affect the quantity of material necessary for acceptable application of the required air barrier assembly or its components. Material quantities that exceed the air barrier manufacturer's typical coverage and thickness expectations due to sheathing characteristics shall be the responsibility of the Contractor and will be accepted neither as a basis for claim nor adjustment to Contract Sum or time.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Exterior Gypsum Sheathing: ASTM C 1177, Type X silicone treated core with glass fiber facings and manufacturer's standard edges 0.5 inch thick.
1. Walls and Exterior Soffits: G-P Dens Glass Gold Exterior Guard, USG Securock Ultralight Glass-mat Sheathing, CertainTeed or approved.
2. Gypsum sheathing boards in roof assembly are work of section 07 51 00.
3. Parapet Walls: ASTM C 1177 glass-mat sheathing Type X approved by the panel manufacturer and acceptable by the manufacturer of the membrane roofing as a substrate to receive the assembly required.

B. Structural Sheathing: ICC-ES listed water-resistant gypsum core reinforced with 22 gage galvanized sheet steel; Sure-board Series 200 Structural Panels. http://www.sureboard.com

C. Cement Board: ASTM C 1325, endorsed by the manufacturer for exterior applications as required for the Work; UISG Durock Cement Board, National Gypsum Permabase Cement Board, 0.5-inch thickness square or tapered joints as recommended by manufacturer is the basis of design.
   1. Flexural Strength: ASTM C 947, 750 psi.
   2. Fastener Holding: ASTM D 1307 90 pounds, 0.4-inch diameter fastener head.
   3. Joint Reinforcing: PermaBase polymer coated alkali resistant mesh, 4 inches wide.
   4. Bonding Material: ANSI A118.1 or 118.4 Portland cement-based mortar or as otherwise recommended by manufacturer for Project applications required.

D. Metal Framing Systems: Comply with requirements of Section 05 40 00 Cold Formed Metal Framing; size ceiling supports to comply with ASTM C 754 except as otherwise required.

2.2 ACCESSORIES

A. Accessories: ASTM C 1047; Standard types as required; galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound, and one-piece control joint beads.

B. Anchors for Exterior Sheathing: Provide bugle-head, self-tapping/driving fastener types, size, length and thread configuration necessary for each Project application and complying with ICC-ES Report for fastener performance characteristics and as necessary for each Project-specific application and compliance with performance requirements.
   1. Fasteners Covered by Water-Resistant Air Barrier: Organic polymer coating shall have a salt-spray resistance to red rust of more than 800 hours per ASTM B 117. ITW Buildex; Teks Maxiseal with Climaseal finish Textron Inc., Textron Fastening Systems; Elco Dril-Flex with Stalgard finish or approved.
   2. Fasteners Not Covered by WRAB: Shall have salt spray resistance of 2,000 hours; Stalgard AS Class 4 or approved.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Metal Framing: Comply with requirements of Section 05 40 00.

B. Gypsum Sheathing: ASTM C 1280, GA201; Face side out, joints tightly butted, plumb, level and square; shim as necessary to maintain required tolerances. Do not use damaged boards.
   1. Joints: Minimum number possible; stagger not-less-than one foot in alternate courses. Install boards with long edge orientation per manufacturer's recommendation for each application required.
   2. Isolate sheathing at structural abutments; provide 0.25 to 0.5 inch space, trim edge with U or J-type semi-finishing edge trim, and seal joint with sealant.
   3. Seal panel joints as necessary to provide a secondary air infiltration barrier and coordinate with work of Section 07 25 00 for details compatible with air barrier installation.

C. Cement Board: Comply with manufacturer's recommendations for exterior applications indicated on A523, A531 and as otherwise required for the Work. Mechanically attach to supports to comply with performance requirements of Section 07 42 00
   1. Panel Edges: Square or tapered as best suited to application per manufacturer's recommendations.
   2. Joint Treatment: Tape joints with specified joint reinforcing bedded in bonding material unless otherwise acceptable.

D. Locate long edges over supports. Attach to framing and supplementary support at corners, openings, cutouts, and penetrations.

E. Provide control joints at locations recommended by the manufacturer for the installation conditions encountered in the Work.

3.2 TOLERANCES

A. Exposed joints, including control joints and sealant joints at openings: Straight, plum and regular. Limit variation in width to 1/8 inch total in 10 feet; variation from plumb 0.125 inch in 8 feet; variation from location indicated plus or minus 0.125 inch.

B. Variation of board surface from plum and level: Plus or minus 0.25 inch in any 4 foot by 8 foot panel or section.

END OF SECTION

SECTION 06 20 00 – FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes materials, work and services necessary and required for nonstructural finish carpentry work which is exposed to view, is primarily site fabricated and assembled, and not specified as part of other sections.

B. Related Sections:
1. Section 06 10 00 Rough Carpentry.
2. Section 06 40 00 Architectural Woodwork.
3. Section 08 14 00 Wood Doors.

1.2 SUBMITTALS

A. Product Data: Submit as required for each manufactured product to be incorporated into the Work.

B. Shop Drawings: Plans, elevations and large-scale details; locate casework, paneling, and trim, attachment, hardware and accessories.

C. Samples:
1. Wood Products: Submit for each species, cut, profile, and finish required; demonstrate range of color and grain variation expected in Work. Two feet by board, molding, or panel width.
   a. Solid Stock, including Composite Decking: 3 samples of each, finish one side and one edge.
   b. Veneers, Panels, Plywood: 2 samples of each, one finished.
2. Hardware: One sample of each type and finish required for approval of function and appearance.

1.3 QUALITY ASSURANCE

A. Fabricator and Installer Qualifications: Five years successful experience with Work similar to that required for this Project, regularly and presently construct finish carpentry as a principal service and have proper equipment for Work as outlined in Standards.

B. Installer and Fabricator Certification: Five recent jobs similar this Project, include project and contact name, location, and date.

C. Pre-Installation Conference: Prior to delivery of materials meet with Architect, installers of finish carpentry and other trades whose Work may affect conditions required for installation of finish carpentry. Review coordination and environmental controls required for proper installation and ambient conditioning in areas to receive work. Proceed with Work only when everyone concerned agrees that required ambient conditions can be maintained.

1.4 PROJECT CONDITIONS

A. Temperature and Humidity for Installation: As required by fabricator to maintain moisture content of installed Work within 1.0 percent of optimum moisture content, maintain conditions until final acceptance.
   1. Store materials only in areas meeting requirements specified for installation areas.

1.5 SEQUENCING AND SCHEDULING

A. Complete work in installation areas which could damage finish carpentry and establish controlled environmental conditions prior to delivery of materials.

B. Conditioning Period: Store wood products for four days (96 hours) at Project prior to installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Solid Stock: Kiln-dried, S4S; softwood complying with American Softwood Lumber Standard PS 20 and referenced grading rules; hardwood complying with National Hardwood Lumber Association rules; glued-up lumber complying with American Softwood Lumber Standard PS 56. Nominal sizes are indicated, except as shown by detailed dimensions. Provide actual sizes as required by PS 20, unless otherwise indicated.
   1. Moisture Content: Limited to values required by referenced grading rules, and woodworking standard.
   2. Material for Transparent Finish: Solid lumber stock.
   3. Material for Painted Finish: Solid lumber or glued-up lumber.
   4. Glued-up Lumber for Exterior Use: PS 56, Wet Use.

B. Plywood: Softwood complying with American Softwood Lumber Standard PS 1-74, and hardwood complying with PS 51.

C. Preservative Treatment by Pressure Process: AWPA U1 for lumber, plywood, and Glue-Laminated Timbers. Treatment containing neither arsenic nor arsenate, non-toxic when cured and free of chemical compounds not acceptable in the Work. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, and otherwise adversely affect finished appearance. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
   1. Subject to compliance with Project requirements provide one of the following treatments.
      a. Ammoniacal, or amine, copper quat (ACQ).
      b. Copper bis (dimethyldithiocarbamate) (CDDC).
      c. Ammoniacal copper citrate (CC).
      d. Copper azole, Type A (CBA-A).
      e. Zinc or Sodium Borate (DOT).
   2. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

a. For exposed lumber indicated to receive a stained or natural finish, mark end or non-exposed surface of each piece, or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Fire-Retardant Treated Wood (FRTW): Materials that comply with performance requirements in AWPA U1 for lumber and plywood. Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664, for lumber and ASTM D 5516, for plywood.
2. Use treatment that does not promote corrosion of metal fasteners and that is free of halogens, sulfates, chlorides, and ammonium phosphate.
3. Exterior Treatment: Exposed exterior wood and interior applications where conditions of service are similar to exterior exposure.
4. Interior: Type A High Temperature (HT), Reduced hygroscopic, non-blooming chemicals unless otherwise required. Chemical treatment shall neither bleed-through nor adversely affect finished appearance.
5. Fire Retardant: Provide for lumber and panels as indicated. Fire retardant treated finish wood shall comply with requirements of the Section where the work is specified.

E. Woodworking Standard: Architectural Woodwork Institute (AWI) Quality Standards.

F. Exterior [Composite] Decking: BOD decking products are as manufactured by Resysta USA or approved equal.
1. Size: 5/4 x 6-inch nominal by lengths indicated in Drawings. Where not shown, provide in longest length available and under no circumstances less than 10 feet in length.
2. Color: As selected by Architect from manufacturer’s standard and premium colors.
3. Grade and edge treatment: Manufacturer’s standard extruded profile; edge profile(s) as shown in Drawings. Where not shown, provide edge profile(s) directed by Architect.
4. Installation:
   a. Concealed Clip and 316 stainless steel small head screw to framing for gapped installation.
   b. Tongue and Groove Decking: Install per manufacturer’s guidelines for concealed tongue (field) and exposed face (starter and terminal) screwed boards, using stainless steel screws. Nailing and stapling are prohibited.
5. Texture: As selected by Architect from manufacturer’s standard finish options.
6. Slip-resistance: Wet Method Value of 55 or greater measured by Pendulum DCOF Slip Resistance Test Method (ASTM E303-22).

G. Exterior Hardwood Decking: Ipe, Brazilian Walnut (Handroanthus spp.):
1. Size: 4 x 4 and 4 x 6 (nominal) in length indicated; provide full width at elevated walkway decking.
2. Edge treatment: Provide eased edge at decking.

H. Interior Finish Carpentry:
1. Standing and Running Trim: AWI Custom grade for quality of materials and manufacture.
   a. Transparent Finish: NHLA First Grade Lumber [Plain Sawn] [Rift Sawn] [Quarter Sawn] Species TBD, Clear, no heart, free of mineral streaks.
   b. Painted Finish: Group 1 soft-wood species, WWPA C-Select.

2. Hardwood Plywood Stock Panels: ANSI/HPMA HP 1983, Premium Grade, Type II, Rotary cut Natural Birch faces, sound hardwood veneer core, number of plies required for thickness indicated.
   a. Face Pattern: Plain edge matched veneer.
   b. Panel-to-Panel Veneer Matching: No match.
   c. Face Veneer Matching (Panel-to-Panel): Sequence matched from one or similar flitches as required by quantity of panels.
   d. Finish: Polish sanded.
   e. Finish: Prefinished with manufacturer's standard clear factory finish.

I. Interior Finish Carpentry: Solid sawn lumber and composite components as required. Seal solid stock lumber at mill, all edges and faces.
   1. Standing and Running Trim: WIC Quality Standards Section 3, Plain sawn WWPA Prime Finish VG Douglas Fir unless otherwise required.
      a. Solid Stock Douglas Fir: Transparent finish, Premium Grade; provide at doors and exterior windows as scheduled.
      b. Medium Density Fiberboard: Formaldehyde free; Medite II or equal. Opaque painted finish, Custom Grade; typical except where solid stock material is required for transparent finish.

J. Miscellaneous Materials:
   1. Fasteners and Anchorages: Nails, screws and anchors of type, size, material and finish required for application indicated; ASTM A 153 galvanized where exposed to exterior and high relative humidity. Use concealed devices to greatest extent possible.
      a. Provide special fasteners, moldings, adhesives and accessories as necessary for each installation.
   2. Isolation Membrane: Self-adhering non-asphalt based, breathable, water-proof membrane; WR Grace Perm-A-Barrier VPS.

2.2 SOURCE QUALITY CONTROL

A. Lumber and Plywood: Factory-mark identify type, grade, mill and grading agency, submit mill certificate in-lieu-of marking surfaces to receive transparent finish.

B. Do not stamp or mark surfaces which will be exposed to view in completed structure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Discard units of material which are unsound, warped, bowed twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacture with respect to surfaces, sizes or patterns.
   1. Wood Products with Chemical Treatment: Material not certified by the manufacturer as compatible with contact surfaces and substrates shall be separated from contact with other materials by contiguous layer of the specified isolation membrane applied to all contact surfaces.

B. Install the work plumb, level, true and straight. Provide concealed shims to achieve required alignments, accommodate variations in adjacent and supporting assemblies, and maintain

tolerances. Cope, miter, and scarf to produce tight fitting joints with full surface contact. Scribe and cut work to fit adjoining work including walls and floor and refinish cut surfaces or repair damaged finish at cuts.

1. Tolerance For Countertops: 1/8 inch in 8 feet for plumb and level, and 1/16-inch maximum offset in flush adjoining surfaces, and 1/8-inch maximum offset in revealed adjoining surfaces.

C. Secure finish carpentry work in place. Use concealed fasteners and blind nailing wherever possible.
   1. Exposed fasteners: Fine finishing nails countersunk, filled flush and finished to match adjacent surface unless otherwise indicated.

D. Solid Stock Exterior Work and Interior Work Subject to High Humidity and Wet Environment: Back prime, comply with Section 09 91 13 and 09 91 23 requirements and referenced woodworking standard.

E. See Section 09 91 13 and 09 91 23 for finishing requirements for installed finish carpentry.

F. Standing and Running Trim: Use minimum number of joints possible, using full-length pieces (from maximum length of lumber available). Stagger joints in adjacent and related members.
   1. Apply flat grain lumber with bark side exposed to weather.

G. Plywood Paneling: Select and arrange panels on each wall for best match of adjacent panels. Attach to supports as indicated.

H. Adjust joinery for uniform appearance. Repair damaged and defective Work. Replace Work that cannot be satisfactorily repaired.

I. Prevent damage and deterioration of installed Work; maintain environmental conditions as required and as recommended by installer.

END OF SECTION

SECTION 06 40 00 – ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for casework and architectural woodwork exposed to view in the finished building that is predominantly manufactured and finished off site.
   1. Provide wood framing and furring necessary for support of architectural woodwork assemblies as indicated.

B. Related Sections:
   1. Section 05 50 00 Metal Fabrications.
   2. Section 08 71 00 Door Hardware.

C. References: Architectural Woodwork Standards current edition as published by Architectural Woodwork Institute.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Prior to fabrication and delivery of materials, Contractor shall meet with fabricator and installer of architectural woodwork, and work of other trades that may affect sequence, fabrication and installation requirements for architectural woodwork; proceed only when coordination tasks have been satisfactorily completed.
   1. Verify environmental controls for compliance with ambient conditions for staging and installation areas for first-in-place and subsequent work.
   2. Review requirements for First-In-Place samples.
   3. Integration of building services into casework and coordination with characteristics of building services; complete field measurement prior to fabrication and shop assembly as necessary or appropriate for the work.
   4. Provisions for attachment to building floor slabs, walls and other construction as necessary for stability of installed work; give particular attention to requirements and characteristics of supporting assemblies and compliance with Related Sections requirements for support fabrications.
   5. Coordinate with partition and finish trades ensure compliance with requirements for installation of the work and verify appropriate delegation for final service connections being performed as work of other Sections.
   6. Field verification of dimensions affecting shop fabrication and assembly of the work.

B. Work Sequence: Ensure compliance with Project Schedule for fabrication and installation of work; deliver work of this Section to the Project neither prior to establishment of required environmental conditions nor before the work is required for installation.
   1. Schedule work to limit potential for damage to installed casework due to subsequent activities of other trades and protection provisions for installed work.
   2. Conditioning Period: Store work at Project for 96 hours unless otherwise recommended by referenced woodworking Standard.

1.3 SUBMITTALS

A. Product Data: Submit as required for each manufactured product, material, accessory, and finish to be incorporated into the Work.
   1. Fire Retardant Treated Wood: Demonstrate compliance with System Description requirements for casework components and assemblies in select locations.
   2. FSC Certified Wood: For each firm supplying wood products and each firm performing fabrication work on these wood products provide firm's COC number, identify each FSC certified product on a line-item basis and identify the material cost and value-added fabrication cost.
      a. Vendor Chain-of-Custody
      b. Fabricator Chain-of-Custody
      c. Installer Chain-of-Custody provide when the installer is other than the fabricator.

B. Shop Drawings: Plans, elevations and large-scale details; locate casework, paneling, and trim; show attachment and support from building, hardware and accessories.
   1. Indicate extent and location of fabrication work deferred to the field; field application of finishes is not acceptable.
   2. Show each method of anchorage to be used, identify fasteners and hardware, locations where the anchorage is proposed and coordination with supporting structure.
   3. Coordination of utility lines serving casework, connection of utilities and controls.
   4. Wood Paneling: Indicate complete elevations of rooms to receive paneling.

C. Samples: Provide a minimum of five samples or sample sets where multiple pieces are required; 12 by 12 inches of panel materials and 12-inch length by typical width of linear material.
   1. Solid Surface Panels: Two pieces of each type and thickness required nominally one square foot finish four edges as required for the work.
   2. Plastic Laminate: One sample of each color, and surface type. Provide flat surface, and section of outside corner of work surface in configuration required.

D. First-In-Place Sample: Refer also to Section 01 33 00. Before fabricating and installing interior architectural woodwork, build First-In-Place Sample as indicated below:
   1. Prepare First-In-Place Sample of Bench Seating using materials proposed for the work.
   2. First-In-Place Sample will be maintained during construction as standard for acceptance of completed work,
   3. Obtain Architect's approval of final finish of First-In-Place Sample before starting remaining interior architectural woodwork fabrication. Approved sample may become part of the Work.

1.4 QUALITY ASSURANCE

A. Fabricator: Work of a single entity unless otherwise acceptable. Demonstrate minimum of five years successful experience with architectural woodwork and casework utilizing similar materials and of similar type, complexity and scope as required for the Work on projects of similar size and quality to that specified and shown.
   1. Comply with AWI Woodworking Standards for materials and fabrications required in addition to specific Project requirements.

B. Installer: Successful history of installation of Architectural Woodwork, including but not limited to logistical capability, installation sequence and proper handling of preassembled and partially assembled components for final fitting and installation in the field.

1. Firm shall be acceptable to the fabricator unless otherwise approved.

C. Fabricator and Installer: AWI member for the category of services they will provide or other acceptable credentials establishing expertise for the services to be provided.

1.5 PROJECT CONDITIONS

A. Temperature and Humidity for Installation: As required by referenced quality standards, and fabricator to maintain moisture content of installed Work within 1.0 percent of optimum moisture content, maintain conditions until final acceptance.
1. Store materials only in areas meeting requirements specified for installation areas.

B. Field Measurements: Taken prior to fabrication of woodwork to be fitted to other construction, verify dimensions on shop drawings.
1. Avoid delay of Project, allow for subsequent scribing and trimming of woodwork for accurate fit where field measurement is impractical.

1.6 PRODUCT HANDLING

A. Without limitation, protect architectural woodwork from damage and loss during fabrication, shipping, handling and installation to Substantial Completion due to shipping, handling, hoisting, exposure to environmental conditions outside of required parameters, work schedule, sequence, means and methods.
1. Maintain protection of architectural woodwork and casework from the shop to Project, during and following installation. Remove protection when directed to allow for observation of work by Architect.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements:
1. Provide concealed and semi-concealed attachment of finished components as required and as demonstrated in approved submittals.
2. Framing, Furring and Supports: Provide final determination of components sizes, spacing, connection types and fastening for architectural woodwork fully concealed from view in completed work and complying with Performance Requirements.
3. To the maximum extent practical for the work select material and component sizes and configurations and woodwork assemblies to minimize the number and frequency of visible joints in the installed work; indicated provide joint locations, types and spacing in shop drawings.
4. Barrier Free Access: Comply with requirements of ANSI A 117.1 and 2022 CBC for reach ranges and clearances.

B. Performance Requirements:
1. Provide fire retardant treated wood as necessary for compliance with CBC Section 410 requirements for platforms; Table 803.9 and Section 803.11 requirements for supports for panels and similar wall surfacing.
a. Treat wood components to achieve ATM E 84 Class flame spread of 25 or less and smoke development of 50 and as otherwise necessary for compliance with Code.

2. Support architectural woodwork and casework to comply with CBC Chapter 16 structural criteria and deflection limitations for assembly types required and to resist forces incidental to intended conditions of service.
   a. Provide for attachment of supports to building structure or other construction in an approved manner complying with CBC and requirements of Building Official.
   b. Resistance to Seismic Forces; Comply with requirements of CBC 1613.1 for resistance of non-structural components that are permanently attached to structure per seismic criteria in the General Structural Notes.
   c. Construct cabinets to support 200 pound dead load on countertop.
3. Shelves for Casework and Wall Mounting: Thickness not less than AWS Section 10 Assembly rules and as otherwise necessary to limit deflection to 0.25 inch or less for a uniform load of 40 pounds per lineal foot.
   a. Spans greater than 42 inches are not acceptable regardless of materials composition.
4. Composite Wood Products shall meet California Green Building Standards Code Title 24, Chapter 11 (CALGreen) compliance requirements: hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure (ATCM) for Composite Wood.
   a. Materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.
   b. Documentation: Section Compliance verification shall be provide as required by 5.504.4.5.3.

2.2 MATERIALS

A. Opaque Finish Wood Trim: Solid stock hardwood species complying referenced woodworking standard requirements for Custom Grade opaque finish material.

B. Medium Density Overlay MDO Panels: 0.75 inch thick, minimum seven ply APA Group I B-B solid veneer layers free of splits and all other voids. Both faces finished with resin-treated, cellulose-fiber sheet complying with PS-1 specifications, and permanently fused to plywood under heat and pressure. Non added urea-formaldehyde.

C. High Pressure Plastic Laminate: Comply with National Electrical Manufacturer's Association (NEMA) publication LD 3. Provide General Purpose, Vertical and other material Grades as required for the Work.
   1. PL1: Nevamar Miesian, Wood Essence.
   2. PL2: Nevamar Miesian, Textured Suede.
   3. PL3: Wilsonart Morelia Mango, Timbergrain.
   4. PL4: Nevamar Aqua Mini Raffia, Textured Suede.
   5. PL5: Laminart Classic Brushed Champagne, Brushed.
   6. PL-6: Nevamar Gunmetal, Textured Suede.
   7. Bonding Adhesive: Urea-formaldehyde free, water resistant and suitable for the type of laminate and substrate being bonded.

D. Resin - Mineral Composite Panel Indicated as SS1: Homogenous composite of minerals and resins fabricated using heat and pressure to produce proprietary panel products; provide sheet sizes to minimize waste and field joints. Wilsonart Quartz is the Basis of Design.
   1. Slab Thickness: Reference Drawings for requirements.
   2. Edges: Finish profile indicated.
   3. Color: Graphite.

E. Solid-Surfacing Material indicated as SS2: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements in ANSI Z124.3, for Type 5 or Type 6. Corian Solid Surface is Basis of Design.
   1. Slab thickness: Reference Drawings for requirements.
   2. Edges: As indicated.
   3. Finish:
   4. Color: Bone.

F. Resin Composite Panel indicated at SS3: Homogenous composite of cellulose or other non-mineral fibers and resins fabricated under heat and pressure to produce a dense hard panel; provide sheet sizes to minimize waste and eliminate field joints. Trespa Toplab is the Basis of Design manufacturer.
   1. Slab Thickness: Reference Drawings for requirements.
   2. Edges: As indicated.
   3. Finish:
   4. Color: Slate Gray.

G. Cabinet Hardware: Comply with ANSI/BHMA A156.9, Grade 1, Heavy Duty. Provide cabinet hardware and accessories as required.
   1. Exposed Hardware Finishes: Provide finish compliant with ANSI/BHMA A156.18 for BHMA finish number indicated.
      a. Satin Chromium Plated: BHMA 626 for brass or bronze; BHMA 652 for steel base.
      b. Satin Stainless Steel: BHMA 630.
   2. Concealed Hardware Finishes: Provide manufacturer's standard finish compliant with ANSI/BHMA A156.9 product class requirements.
   3. Door and Drawer Pulls:
      a. Wire Type: Back-mounted, stainless steel, solid metal, finish as selected: Doug Mockett DP57 Series or equivalent from Hafele.
         1) 6-inch on drawers and upper and base cabinet doors.
         2) 12-inch on full height cabinet doors.
   4. Shelf Pins: Plated steel, ANSI/BHMA A156.9, meet or exceed Grade 1 B04013; Plated Steel 0.5mm hole diameter with seismic (earthquake) pin and pre-drilled hole for seismic fasteners to shelf; 50 ponds per clip working load capacity. Plastic clips are not acceptable and will be rejected.
      a. Hettich Sekura #1, US Futaba 72511 52 068, or equal.
   5. Concealed Hinges: Eurostyle Hinge, Blum Soft-Close 110-degree BLUMotion hinges required for face-framed or frameless cabinet door as indicated in Drawings, nickel finish.
   6. Continuous Hinges: Medium gauge piano style made of 0.040-gauge steel with 0.10-inch diameter pin, satin nickel finish.
   7. Casework Door Catches: Magnetic type; Ives 325, 12 lb. pull.
   8. Drawer Slides: Meet or exceed ANSI/BHMA 156.9 Grade 1, Heavy Duty.
      a. Acceptable manufacturer: Accuride International Inc., Sata Fe Springs, CA.
      b. Drawer capacity up to 200 lb and up to 24 inches wide: Accuride #3640A.
      c. Drawer capacity up to 350 lb and up to 42 inches wide: Accuride #7957.
      d. Drawer capacity up to 600 lb and up to 60 inches wide: Accuride #9301E.
   9. Door and Drawer Silencers: ANSI/BHMA A156.16, L0311.
   10. Grommets: Aluminum or laminate as required to line and close penetrations in countertops and cases.
      a. Laminate Cap Grommets: Provide at laminate countertops.
         1) 3-inch OD molded plastic grommets and matching plastic caps with slot for wire passage except as noted otherwise. Laminate to match adjacent countertop laminate.

2) Manufacturer: LG3 Laminate Cap by Doug Mockett & Co.

b. Satin Aluminum Cap Grommets: Provide at non-laminate countertops.
   1) 3.5-inch OD, satin aluminum grommets and matching satin aluminum caps with oval cord slot lined with radiused brush for wire passage except as noted otherwise.
   2) Manufacturer: ABG3-94 by Doug Mockett & Co.

c. Drawer and Cabinet Locks: ANSI/BHMA 156.11, E07041.
   1) Acceptable Manufacturer: Olympus Lock, Inc., Lynwood, WA. 800.525.0954; www.olympus-lock.com.
   2) Product: 700SC deadbolt lock for cabinet doors; 800SC deadbolt lock for cabinet drawers.
   3) Pro ide locs at drawers, single doors and on active leaf of paired doors as indicated on Drawings.
   4) Provide 2 keys for each lock.
   5) Provide lock for active leaf of pairs of doors with elbow catch for inactive leaf.

H. Mounting Hardware for Panels: Concealed clips for demountable installation; 2.5-inch pairs of interlocking metal Zee clips.

I. Anchors, Screws and Nails: Material, type, size and finish required for each use. Comply with applicable requirements of ASTM A 307 for screws and ASTM F 1667 for nails.
   1. Exterior Woodwork: Any non-corrosive metal nail, except use stainless steel for work with transparent finish.
   2. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, to be set into concrete or masonry work for anchorage of woodwork.

2.3 FABRICATION

A. Fabricate woodwork to dimensions, profiles, and details indicated with openings and mortises precut, where possible, to receive hardware and other items and work.
   1. Assemble woodwork and casework in shop, disassemble for shipment and reassemble with concealed fasteners in the field.
   2. Include all preparations fixtures and services for plumbing, mechanical, electrical, telecom and signal work.
   3. Fire Retardant Chemical Treatment of Wood Products: Compatible with adhesives, and specified finishes, non-pressure process, non-aqueous solution, no adverse impact on appearance of treated wood. Treatment is in addition to other applied finish requirement.

B. Ease edges to 0.0625-inch radius, for corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness, 0.125-inch radius for edges of rails and similar members over 1 inch in nominal thickness.

C. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Shelves for Casework and Wall Mounting: Approved panel product in thickness indicated and as necessary to comply with Performance Requirements.
   2. Dado Case for recessed installation of shelf standards where adjustable shelves are required inside cabinet.

D. Pre-Cut Openings: Provide as necessary for hardware, appliances, equipment, service connections and other components. Locate and size openings accurately. Use templates or roughing-in diagrams for accurate sizing and configuration. Ease cut edges and seal cutouts with a water-resistant coating. Finish exposed exterior and interior edges to comply with Section 10 Material Rules, finish semi-exposed edges as required for exposed edges.
   1. Provide grommets in configuration necessary to line and close countertop and case penetrations.

E. Standing and Running Trim and Rails Standing and Running Trim and Rails: AWS Quality Standards Sections 6 and 7, Premium Grade:

F. Casework Cabinets: Comply with AWS Section 10, flush overlay construction, Custom grade except as required for door backs and edges and as specified for wood cabinets.
   1. Laminate Cladding: HGS laminate on horizontal surfaces, VGS laminate on vertical surfaces, and VGL laminate on semi-exposed surface.
      a. Edges: Match face.
      b. Orient pattern of wood grain laminate vertically, unless otherwise indicated on Drawings.
   2. Balance Backing:
      a. Wood Backing: Straight-grained hardwood of the same thickness and grain orientation as the face veneer; thickness and species characteristics well suited to use as a backing veneer with the face veneer required.
      b. Plastic Laminate Backing: 0.020 phenolic backer is required for all panels and components regardless of reference woodwork standard requirements for the grade of workmanship specified.
   3. Doors and drawer fronts and fixed panels thickness indicated and as required for flush overlay construction.
   4. Cabinet hardware as indicated.
   5. Separation between adjacent cabinet doors shall be uniform dimension not exceeding 0.125 inch. Coordinate door and case fabrication, hinge prep and installation to ensure compliance with this requirement. Uneven work and work with excessive gaps will be rejected.
   6. Cabinet Bases: Solid stock wood with laminate cladding as required for door and drawer front including balance backing.

G. Open Storage Compartments: AWI Section 10 Custom Grade and per Project requirements for Frameless box construction with concealed joinery for fixed divider shelves, Stop Dadoed to case body members - dowel and dowel-screw joinery are not acceptable. Provide box and divider shelf dimensions and configuration as indicated.
   1. Storage Below Fixed Bench:

H. Cabinet Tops: AWS Section 11, Custom Grade fabrication.
   1. Substrate Product: Required panel product; provide waterproof substrate 2 feet each-side of sink openings, and areas exposed to water.
   2. Solid Surface: Provide in configuration shown fabricated per manufacturer’s recommendations. Provide under-counter mount sink complying with barrier free access reach range; coordinate with fixtures and plumbing work of Division 22 Sections.

I. Worksurfaces: As required for Cabinet Tops and as follows.
   1. Support Brackets: Provide a minimum of one pair of supports for each worksurface up to 48 inches in length and one additional support for every 2 lineal feet of worksurface, or increment thereof, exceeding 48 inches and as otherwise necessary for support of worksurface configuration required and as necessary for loads and service conditions.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install woodwork plumb, level, true and straight with no distortions. Scribe and cut woodwork to fit adjoining work including variations in finish floors, and refinish cut surfaces or repair damaged finish at cuts. Coordinate woodwork with electrical and plumbing work.
   1. Shims: Concealed, provide as necessary due to conditions encountered and as otherwise necessary for compliance with Project requirements.

B. Secure Work to supporting construction reinforced as required for imposed loads, as necessary for compliance with Project requirements and per approved submittals. Use concealed means of attachment unless otherwise required. Countersink, fill flush and finish exposed fasteners to match adjacent surface, unless otherwise indicated.
   1. Coordinate with work of Section 05 54 000 and this Section; Reference Drawings for countertop support brackets, backing plates and reinforcing locations and requirements in framed walls.

C. Architectural Woodwork: Comply with reference woodworking standard for fabrication Grade specified and Project requirements.
   1. Standing and Running Trim: Gaps behind members shall be filled and finished to match the backing surface.
   2. Cabinets and Casework: Division B, Custom grade.
      a. Cabinet Base: Scribe to fit variations in finish floor and set in sealant.
      b. Backsplash: Fill gaps to wall exceeding 0.125 inch with an approved filler material.
   3. Paneling: Division C, Premium grade.
   4. Wood Bench: Coordinate with work of Section 05 50 00 to ensure configuration of wood fabrications and attachment to metal supports as required.

D. Field Joints: Acceptable only as shown on approved submittals. Install work with the minimum number of joints possible. Cope and miter joints; stagger joints in adjacent and related members. Comply with AWI Quality Standards referenced for shop fabrication.

E. Tolerances: 0.125 inch in 8 feet for plumb and level (including tops); and with no variations in flushness of adjoining surfaces, except where referenced standard is tighter.

3.2 ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair replace Work. Adjust joinery for uniform appearance.

B. Clean, lubricate and adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

D. Provide final protection and maintain conditions, in a manner acceptable to Fabricator and Installer, which ensures architectural woodwork being without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 07 01 50.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of This Section Includes:
   1. Full roof tear-off.
   2. Partial roof tear-off.
   3. Temporary roofing.
   4. Roof re-cover preparation.
   5. Base flashing removal.
   6. Removal of existing skylight and equipment curbs and screens as indicated.
   7. Fastener pull-out testing.
   8. Disposal.

B. Related Requirements:
   1. Section 01 10 00 "Summary" for use of premises and for phasing requirements.
   2. Section 01 50 00 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code,”"CALGreen.”

B. California Code of Regulations, Title 24 Part 2, California Building Code (CBC), International Building Code with California Amendments.

1.3 ALLOWANCES

A. Allowance for removal of existing wet insulation, and replacement with new insulation, is specified under Section 01 21 00 "Allowances."

B. Allowance for removal of existing deteriorated metal roof deck, and replacement with new metal roof deck, is specified under Section 01 21 00 "Allowances."

C. Allowance for removal of existing deteriorated wood roof deck, and replacement with new wood deck, is specified under Section 01 21 00 "Allowances."

D. Allowance for removal of existing deteriorated wood nailers and curbs, and replacement with new wood, is specified under Section 01 21 00 "Allowances."

E. Allowance for removal of existing deteriorated parapet wall sheathing, and replacement with new sheathing, is specified under Section 01 21 00 "Allowances."

1.4 UNIT PRICES

A. Work of this Section is affected by [insulation removal and replacement unit price] [metal deck removal and replacement unit price] [roof sheathing removal and replacement unit price] [and] [parapet wall sheathing removal and replacement unit price] <Insert name of unit price>.

1.5 DEFINITIONS

A. EPS: Molded (expanded) polystyrene.

B. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.

C. OSB: Oriented strand board.

D. Partial Roof Tear-off: Removal of selected components and accessories from existing roofing system.

E. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

F. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.

1.6 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof- mounted equipment.
   2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
      a. Reroofing preparation, including roofing system manufacturer's written instructions.
      b. Temporary protection requirements for existing roofing system components that are to remain.
      c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
      d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
      e. Existing roof deck conditions requiring Architect notification.
      f. Existing roof deck removal procedures and Owner notifications.
      g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
      h. Structural loading limitations of roof deck during reroofing.
      i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
      j. HVAC shutdown and sealing of air intakes.
      k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
      l. Asbestos removal and discovery of asbestos-containing materials.

m. Governing regulations and requirements for insurance and certificates if applicable.
n. Existing conditions that may require Architect notification before proceeding.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Temporary Roofing Submittal: Product data and description of temporary roofing system.
1. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer stating acceptance of the temporary roof and that its inclusion does not adversely affect the new roofing system's resistance to fire and wind or specified special warranty.

1.8 INFORMATIONAL SUBMITTALS

A. Field Test Reports: Fastener pull-out test report.

B. Photographs or Video: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
1. Submit before Work begins.

C. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.9 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.10 FIELD CONDITIONS

A. Existing Roofing System: [Built-up asphalt] [Built-up coal-tar] [APP-modified bituminous] [SBS-modified bituminous] [EPDM] [CSPE] [KEE] [PVC] [TPO] [APP-modified bituminous protected membrane] [SBS-modified bituminous protected membrane] [Fluid-applied protected membrane] [Coated foamed] <Insert roof type> roofing.

B. Owner [**will**] [**will not**] occupy portions of building immediately below reroofing area.
1. Conduct reroofing so Owner's operations are not disrupted.
2. Provide Owner with not less than [**72**] <**Insert number**> hours' written notice of activities that may affect Owner's operations.
3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.

a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.

C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Retain first paragraph below and revise to suit Project.

E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
1. A roof moisture survey of existing roofing system is available for Contractor's reference.
2. The results of an analysis of test cores from existing roofing system are available for Contractor's reference.
3. Construction Drawings[and Project Manual] for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.

F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to <**Insert load**> for rooftop equipment wheel loads and <**Insert load**> for uniformly distributed loads.

G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
1. Remove only as much roofing in one day as can be made watertight in the same day.

H. Hazardous Materials:
1. It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
a. Hazardous materials will be removed by Owner before start of the Work.
b. Existing roof will be left no less watertight than before removal.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
a. Hazardous materials will be removed by Owner under a separate contract.
3. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
a. Hazardous material remediation is specified elsewhere in the Contract Documents.
b. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
c. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

1.11 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing

system warranty issued by <**Insert name of manufacturer for existing warranted roof system**>.

1. Notify warrantor before proceeding with the Work.
2. Notify warrantor of existing roofing system on completion of reroofing and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect.
   a. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified

2.2 TEMPORARY PROTECTION MATERIALS

A. Design and selection of materials for temporary roofing are Contractor’s responsibility.

2.3 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are the Contractor’s responsibilities.

2.4 INFILL AND REPLACEMENT MATERIALS

A. Use infill materials matching existing roofing system materials unless otherwise indicated.
   1. Infill materials are specified in [Section 07 51 13 "Built-up Asphalt Roofing"] [Section 07 51 16 "Built-up Coal Tar Roofing"] [Section 07 52 13 "Atactic-Polypropylene (APP) Modified Bituminous Membrane Roofing"] [Section 07 52 16 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing"] [Section 07 53 16 "Chlorosulfonate-Polyethylene (CSPE) Roofing"] [Section 07 53 23 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing"] [Section 07 54 16 "Keytone Ethylene Ester (KEE) Roofing"] [Section 07 54 19 "Polyvinyl-Chloride (PVC) Roofing"] [Section 07 54 23 "Thermoplastic-Polyolefin (TPO) Roofing"] unless otherwise indicated.

B. Wood blocking, curbs, and nailers are specified in Section 06 10 00 "Rough Carpentry."

C. Parapet Sheathing: Match existing, adjacent, undamaged materials.
   1. Plywood roof sheathing is specified in Section 06 16 00 "Sheathing."

D. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

2.5 AUXILIARY REROOFING MATERIALS

A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of [**existing and**]new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:
   1. Protect existing roofing system that is not to be reroofed.
   2. Limit traffic and material storage to areas of existing roofing that have been protected.
   3. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
   4. Comply with requirements of existing roof system manufacturer's warranty requirements.

B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.

C. Shut off rooftop utilities and service piping before beginning the Work.

D. Test existing roof drains to verify that they are not blocked or restricted.
   1. Immediately notify Architect of any blockages or restrictions.

E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
   1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
   1. Prevent debris from entering or blocking roof drains and conductors.
      a. Use roof-drain plugs specifically designed for this purpose.
      b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
   2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
      a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

A. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.

B. Full Roof Tear-off: Where indicated on Drawings, remove existing roofing and other roofing system components down to the existing roof deck.
   1. Remove [substrate board] [vapor retarder] [roof insulation] [and] [cover board].
   2. Remove base flashings and counter flashings.
   3. Remove perimeter edge flashing and gravel stops.
   4. Remove copings.
   5. Remove expansion-joint covers.

6. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
7. Remove roof drains indicated on Drawings to be removed.
8. Remove wood blocking, curbs, and nailers.
9. Remove fasteners from deck[or cut fasteners off slightly above deck surface].

C. Partial Roof Tear-off: [**Where indicated on Drawings, remove**] [**Remove**] existing roofing down to [**existing cover board**] [**existing insulation**] <**Insert substrate**> and immediately check for presence of moisture.
1. [**Engage**] [**Owner will engage**] a qualified testing agency to perform the following test:
   a. Coordinate with Owner's testing agency to schedule times for tests and inspections immediately after removal.
2. Survey exposed substrate that is to remain using infrared color thermography according to ASTM C1153.
   a. Prepare survey report of initial scan indicating locations of entrapped moisture, if any, and area calculations of locations of entrapped moisture.
3. Survey exposed substrate that is to remain using electrical capacitance/impedance testing according to ASTM D7954/D7954M.
   a. Prepare survey report indicating locations of entrapped moisture, if any, and area calculations of locations of entrapped moisture.
4. Survey exposed substrate that is to remain using nuclear hydrogen detection testing according to SPRI/RCI NT-1.
   a. Prepare survey report indicating locations of entrapped moisture, if any, and area calculations of locations of entrapped moisture.
5. Remove wet or damp materials below existing roofing and above deck as directed by Architect.
   a. [Removal is paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.]
6. Inspect wood blocking, curbs, and nailers for deterioration and damage.
   a. If wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
   b. [Removal is paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.]
7. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry.
   a. Remove unadhered bitumen, unadhered felts, and wet felts.
8. Remove excess asphalt from steel deck that is exposed by removal of wet or damp materials.
   a. A maximum of 15 lb/100 sq. ft. (0.72 kg/sq. m) of asphalt is permitted to remain on steel decks.
9. Remove fasteners from deck[**or cut fasteners off slightly above deck surface**].

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
1. Do not proceed with installation until directed by Architect.

C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.

D. Do not proceed with installation until directed by Architect. Replace plywood roof sheathing as indicated on Drawings.

E. Replace plywood roof sheathing as directed by Architect.
1. Roof sheathing replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

3.4 INFILL MATERIALS INSTALLATION

A. Immediately after roof tear-off, and inspection and repair, if needed, of deck, fill in tear-off areas to match existing roofing system construction.
1.

3.5 TEMPORARY ROOFING Retain this article if required.

A. Install approved temporary roofing over area to be reroofed.

3.6 ROOF RE-COVER PREPARATION

A. Remove blisters, ridges, buckles,[mechanically attached roofing fastener buttons projecting above roofing,] and other substrate irregularities from existing roofing that inhibit new recover boards from conforming to substrate.
1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
2. Scarify surface of sprayed polyurethane foam as necessary to achieve a sufficiently uniform plane to receive new recover boards.
3. Broom clean existing substrate.
4. Coordinate with Owner's inspector to schedule times for tests and inspections.
5. Verify that existing substrate is dry.
a. Spot check substrates with an electrical capacitance moisture-detection meter.
6. Remove materials that are wet or damp.
a. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

B. Remove blisters, ridges, buckles,[mechanically attached roofing fastener buttons projecting above roofing,] and other substrate irregularities from existing roofing that inhibit new [recover boards] [roofing] from conforming to substrate.
1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
2. Shave surface of sprayed polyurethane foam as necessary to achieve a sufficiently uniform plane to receive new [**recover boards**] [**roofing**].
3. Broom clean existing substrate.
4. Coordinate with Owner's inspector to schedule times for tests and inspections.
5. Verify that existing substrate is dry before proceeding with installation.
a. Spot check substrates with an electrical capacitance moisture-detection meter.
6. Remove materials that are wet and damp.
a. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

C. Remove blisters and areas of roofing not fully adhered.

D. Remove[**mechanically attached roofing fastener buttons projecting above roofing and other**] substrate irregularities that inhibit new recover boards from conforming to substrate.
   1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
   2. Clean substrate of contaminants, such as dirt, debris, oil, and grease, that can affect adhesion of coated foamed roofing.
   3. Power vacuum the existing roof surface.
      a. If recommended by foam manufacturer, prime dried surface at recommended rate with recommended primer.
   4. Scarify surface of coated polyurethane roofing as necessary to achieve a suitable substrate for new roofing.
   5. Provide additional uplift securement for existing roofing system with new screws and plates applied to each roof zone at the following densities:
      a. Field of roof, one fastener for each <**Insert area**>.
      b. Corners of roof, one fastener for each <**Insert area**>.
      c. Perimeters of roof, one fastener for each <**Insert area**>. Width of perimeter zone of roof is <**Insert dimension**>.
   6. Verify that surface is dry by pressing litmus paper to surface areas most likely to retain moisture, such as shaded areas and low spots.
      a. If paper changes color, surface is too wet to apply foam.
   7. Build up isolated low spots on existing roofing with sprayed foam specified in Section 07 57 00 "Coated Foamed Roofing" to prevent ponding.

3.7 BASE FLASHING REMOVAL

A. Remove existing base flashings.
   1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain.
   1. Replace metal counterflashings damaged during removal with counterflashings specified in Section 07 62 00 "Sheet Metal Flashing and Trim."

C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
   1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

D. Remove existing parapet sheathing and replace with new parapet sheathing to comply with Section 06 16 00 "Sheathing."
   1. If parapet framing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

3.8 FASTENER PULL-OUT TESTING

A. [**Perform**] [**Retain independent testing and inspecting agency to conduct**] fastener pull-out tests according to SPRI FX-1 and submit test report to [**Architect**] [**and**] [**roofing manufacturer**] before installing new roofing system.
   1. Obtain [**Architect's**] [**roofing manufacturer's**] approval to proceed with specified fastening pattern.
      a. [**Architect**] [**Roofing manufacturer**] may furnish revised fastening pattern commensurate with pull-out test results.

3.9 DISPOSAL

A. Collect demolished materials and place in containers.
   1. Promptly dispose of demolished materials.
   2. Do not allow demolished materials to accumulate on-site.
   3. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

C. Debris, waste, and removed materials, other than items to be salvages, are Contractor’s property for legal disposal off the site, as required by applicable Federal and State regulations. Do not allow removed materials to accumulate.

3.10 PROTECTION AND CLEANING

A. Clean roof and surrounding surfaces.

B. In areas where finished surfaces are soiled by bitumen or other materials, clean surfaces with manufacturer’s recommended products and procedures.

C. Repair of replace defaced or damages finishes caused by the work of this Section.

D. Protect installed work throughout construction.

END OF SECTION

SECTION 07 11 15 – BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for subgrade, positive side, bituminous damp proofing system.

B. Related Sections:
   1. Section 07 13 26 Adhesive Sheet Waterproofing.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Sequencing and Scheduling: Apply damp proofing prior to installation of sheet membrane waterproofing where the materials lap or otherwise come into contact, unless otherwise recommended by sheet membrane manufacturer.

1.3 SUBMITTALS

A. Product Data: Required for each waterproofing product to be incorporated into the Work.
   1. Material Samples: Provide upon request.

B. Products for each product to be incorporated into the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, manufacturers offering products which may be incorporated into the Work include but are not limited to the following.
   1. Karnak Corporation.
   2. Sonneborn.
   3. Tremco.
   4. W.R. Meadows, Inc.

2.2 MATERIALS

A. Cold-Applied Asphalt Water Emulsion: Asbestos-free; compatible with sheet membrane waterproofing.
   1. Emulsified Asphalt Mastic: ASTM D 1227, Type III.

B. Accessories: Compatible with damp proofing, and acceptable to manufacturer of primary materials.
   1. Asphalt Glass Felt: ASTM 2178 Type III.
   2. Bituminous Grout: ASTM D 147.
   3. Plastic Cement: ASTM D 491, asphalt base, unless otherwise recommended by damp proofing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Damp proofing: Unless otherwise indicated, apply to concrete walls below grade enclosing unoccupied space, including landscape retaining walls, and walls below grade not required to receive membrane waterproofing. Refer to Section 07 13 00 for waterproofing of other subterranean walls, ensure compatibility between waterproofing, and damp proofing.
   1. Extend from finished grade over top of footing, and six inches down outside face of footing. Lap twelve inches at intersecting walls, and footings.

B. Comply with manufacturer's instructions for installation and details, unless more stringent requirements shown.
   1. Prevent accumulation of fumes, ventilate enclosed spaces until coatings are completely cured.
   2. Prevent spillage and migration of materials onto other surfaces and prevent materials from entering drains and conductors.

C. Fill voids, seal joints, and apply bond breakers as recommended by prime materials manufacturer.

D. Flash joints and reinforce corners prior to application of dampproofing. Comply with details indicated, and manufacturer's recommendations.
   1. Provide two-inch cant of bituminous grout at intersection of vertical and horizontal surfaces.

E. Install asphalt glass felt reinforcing in damp proofing at inside and outside corners, and locations indicated to be reinforced; lap joints 3 inches in direction of water flow. Apply a second coating of bitumen over reinforcing.

F. Coverage: Five gallons per one hundred square feet, and dry film thickness of 30 mils; apply multiple coats as necessary to achieve film thickness.

END OF SECTION

SECTION 07 13 26 – ADHESIVE SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for waterproofing systems for sub-grade concrete walls and for concrete pits and sumps.

B. Related Sections:
   1. Section 03 30 00 Cast-In-Place Concrete.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Comply with requirements for Project meetings.
   1. Review of waterproofing installation requirements including but not limited to environmental conditions, mitigation measures planned for non-compliant installation conditions.
   2. Project Schedule and planned installation sequence and timing for waterproofing.
   3. Details for Project specific installation including without limitation, penetrations, transitions, compatibility with abutting assemblies and protective coverings.

B. Scheduling and Sequencing: Sequence Work to avoid cutting installed membrane for penetrations and cutting and patching for work not properly sequenced; minimize period of exposure of installed membrane.
   1. Work of this Section requires close coordination with work of Division 3 Concrete, Mechanical, Plumbing and Electrical work, and other trades whose work may penetrate waterproofing assemblies or may otherwise affect the integrity of the waterproofing. Coordinate the Work to minimize conflicts, limit the number of penetrations needed, and to ensure a permanently water-tight installation.

1.3 SUBMITTALS

A. Product Data: Required for each waterproofing product to be incorporated into the Work.
   1. Material Samples: Provide upon request.

B. Shop Drawings: Provide layout drawing for each area where waterproofing is required. Indicate type of material to be provided and locations to be reinforced or flashed. Provide Project specific details for installation at drain bodies and other penetrations, transitions, movement joints, and terminations.

C. Certifications: Provide for the following.
   1. Manufacturer Certification: Installer qualifications for waterproofing assemblies required. Certification of compatibility of waterproofing and site conditions as demonstrated by manufacturer’s test results.
   2. Manufacturer and Installer Warranty Certificate.

D. Coordination documentation and Pre-Installation Conference report.

1.4 QUALITY ASSURANCE

A. Qualifications: Installer approved by manufacturer of primary waterproofing materials, a minimum three years' successful experience with installation of waterproofing similar to that required for the Project and approved by membrane manufacturer.

B. Manufacturer's Field Quality Control Agent: Possess expert knowledge of the products being used including preparation, installation and warranty requirements. This agent shall have authority to certify compliance of the Work with Project Warranty provisions.

C. Provide inspector acceptable to waterproofing manufacturer who shall be on site and perform all inspections of the Work necessary for the waterproofing manufacturer to provide the specified warranty.

1.5 FIELD CONDITIONS

A. Provide temporary measures necessary due to Project Schedule, seasonal variations and prevailing weather to establish conditions required for successful application of the specified air barrier assembly including but not necessarily limited to temporary sheltering of work from precipitation, mitigation of temperature extremes and all other controls needed for conditions prevailing at the time of installation at no additional cost to the Owner.

1.6 SPECIAL WARRANTY

A. Project Warranty: Endorsed by manufacturer and installer for assemblies installed as work of this Section regardless of whether all products are from a single manufacturer. Warranty shall provide for correction or replacement of work that fails to remain waterproof or otherwise not remain in compliance with Contract requirements for a term of not less than one year following the date of Substantial Completion. Warranty work shall include removal, and reinstallation of assemblies concealing membrane waterproofing at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURED MATERIALS

A. Single Source of Supply and Responsibility: Work of this Section shall use products of one manufacturer only (the primary manufacturer) to the maximum extent possible. Accessory components not by the primary manufacturer shall be approved by them and shall be covered by the Special Warranty as required for the Work.

B. Sheet Waterproofing: Self-adhering rubberized asphalt membrane integrally bonded to polyethylene film, not less than 56 mils thick; subject to compliance with Project requirements provide GCP Applied Technologies Bituthene System 3000, Henry, or approved.
1. Sheet Thickness: ASTM D 3767 Method A, 60 mils mm total; 56 mils rubberized membrane / 4 mils high density polyethylene film.
2. Tensile Strength : Membrane ASTM D 412 @ 2 inches per minute; 325 psi minimum. Film ASTM D 882 5,000 psi.
3. Ultimate Elongation : ASTM D 412, 300 percent minimum.
4. Lap Adhesion: ASTM D 1876, 5 psi..
5. Hydrostatic Head Resistance: ASTM D 5385, 230 feet min.

6. Water Absorption: ASTM D 570, Not more than 0.1 percent weight gain for 48 hours of immersion at 70 degrees F (21 degrees C).
7. Permeance: ASTM E 96 Section12 water method; 0.1 perms maximum.

C. Accessories for Sheet Waterproofing: Approved by manufacturer of primary materials, and recommended for substrates, and applications required.
1. Sealants, Adhesives and Tapes: Demonstrate compatibility with bonding surfaces and adjacent materials and components and capacity for reliable and permanent adhesive bonding. Provide as necessary for protection board, drainage composite, sheet-good seams, flashings, penetrations and other installation conditions.
2. Primers: As necessary and recommended by manufacturer for application required.
3. Membrane Flashing: Recommended by primary manufacturer for details and conditions encountered, unless otherwise indicated.
4. Termination Bar: 300 Series Stainless steel for water-tight termination of waterproofing and mechanical attachment to supporting construction, provide complete with anchors adhesive, sealants and similar.
5. Metal Flashing: 22 gage Stainless Steel; ASTM A 480, Type 304, annealed, No. 2D, unless harder temper required for forming or performance.
6. Protection: Reinforced asphaltic board, 0.125 inch thick; GCP Applied Technologies Asphaltic Hardboard.

D. Blindside Waterproofing: Multiple layer membrane of high-density polyethylene film with pressure sensitive adhesive specifically intended for use as positive pressure waterproofing; subject to compliance with Project requirements basis of design is GCP Applied Technologies Preprufe 275 or approved; provide manufacturer's recommend accessories for Project specific applications required for both vertical formed and shotcrete applications and under grade-supported concrete slab.
1. Sheet Thickness: ASTM D 3767 250 0.8 mm; 275 0.95 mm.
2. Tensile Strength: ASTM D 412, 250 & 275 4,000 psi, film.
3. Ultimate Elongation : ASTM D 412, 250 & 275 300 percent.
4. Lap Adhesion: ASTM D 1876, 250 4 pounds per inch of width; 275 7 pounds per inch of width
5. Hydrostatic Head Resistance: ASTM D 5385, 250 & 275, 180 feet min.
6. Puncture Resistance: ASTM E 154, 250 & 275, 135 pounds.
7. Permeance: ASTM E 96 Method B, 250 & 275, 0.01 perms maximum.
8. Ancillary Components: Approved by manufacturer of primary materials, and recommended for substrates, and applications required.

E. Drainage Composite: High impact polystyrene core having a 0.375-inch profile for positive flow, with a nonwoven polypropylene geotextile facing and high-density polyethylene backing film. W.R, Grace Hydroduct 220 for vertical assembly [and Hydroduct 600 for horizontal assemblies].
1. Drainage Core Compressive Strength: ASTM D 1621; 15,000 psi (vertical grade material) 18,000 psi (horizontal grade).
2. Geotextile Tensile Strength: ASTM D 4632; 100 pounds (vertical grade material), 200 pounds (horizontal grade).
3. Geotextile Burst Strength: ASTM D 3786 270 psi (vertical grade), 525 psi (horizontal grade).
4. Geotextile Permittivity: ASTM D 4491 130 gallons per minute or greater.

F. Protection Board: Reinforced asphaltic board, 0.125 inch thick; W.R. Grace Asphaltic Hardboard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Excavations are sufficient to provide access to below grade Work; Substrate is dry, fully cured, smooth, free of debris, projections, depressions, and imperfections that might impair performance of installed membrane; Work has been sequenced for installation of membrane as required. Beginning of installation will be interpreted as installer's acceptance of substrate.

3.2 PREPARATION

A. Comply with manufacturer's recommended installation procedures and details, and Project requirements; provide a complete installation of waterproofing that will optimize service life of installed membrane. Provide all accessory components recommended by the waterproofing membrane manufacturer for best practices in Project specific applications regardless of whether they are specified or indicated at no additional cost to the Owner.
   1. Prime surfaces as recommended by prime manufacturer; reprime areas not covered by membrane within 12 hours of primer application.

B. Examine profile of bonding surfaces for conformity to waterproofing manufacturer's recommendations. Remove projections and fill depressions; mitigate texture of bond surfaces and other conditions as necessary to establish acceptable surface for installation.
   1. Penetrations: Pack solid with grout to ensure the penetrant remains stable in the completed assembly. Unrestrained components may compromise waterproof assembly integrity and are not acceptable.

3.3 WATERPROOFING FOR SUB-GRADE CONCRETE

A. Sheet Waterproofing: Self-adhesive membrane together with the necessary accessories to provide a complete waterproof membrane on all subgrade concrete work. Seal projections through membrane, seams, and flashings. Extend waterproofing across entire subgrade surface; provide termination proximate to finish grade as required complete with all necessary accessory components. In addition to the components specified for each assembly provide appurtenances and incidentals necessary for a complete waterproof installation complying with Contract and Project Warranty requirements.
   1. Prior to placement of concrete, protect installed waterproofing from damage due to construction activities and exposure to precipitation and other weather conditions that could impair its performance.
   2. Waterproofing at Pits and Sumps: Provide water-tight transition between vertical waterproofing and horizontal vapor barrier reinforce transitions and terminations as necessary for conditions encountered; seal at drain bodies, penetrations, and seams.

B. Waterproofing Penetrations: Following application of sheet layer of waterproofing, thread a single piece of sheet membrane over the penetrant and place a one-inch-tall fillet of mastic around the penetrant and extending 2 inches onto the sheet; cut-and-lapped sheets are not acceptable. Size the sheet to allow a minimum 10 inches over-lap onto the penetrated surface.
   1. Coordinate waterproofing at reinforcing bar and dowel penetrants with bond requirements for concrete work to be placed on reinforcing or dowel; ensure positive bond between concrete and reinforcing or dowel.

2. Following placement of concrete per Contract requirements, inspect penetrations that remain visible for stability and complete bonding with concrete. Correct poorly bonded items as necessary to ensure integrity of waterproofing.
3. Provide stainless steel fabrications, termination bar and similar fabrications as necessary for waterproofing and protection of penetrations, waterproofing transitions and terminations as required for the Work.
4. Protection Board: Provide over sun grade and exposed waterproofing indicated to have neither rigid insulation covering nor drainage composite.

C. Intersection and Termination of Waterproofing with Under-slab Vapor Barrier: Integrate waterproofing with work of Section 07 26 00. Provide accessory components as necessary for work of this Section to make a water-tight transition to bonded vapor barrier work of section 07 26 00.
1. Footing, grade Supported Slab Edge and Similar: Cover vertical faces, exposed edges and subgrade portions of the foundation to prevent contact with moisture in soils and on grade.
2. For termination near finish grade provide specified mechanically anchored membrane termination bar bedded in mastic. Provide stainless steel counterflashing where indicated.
3. Provide complete accessory components to seal and reinforce inside and outside corners, vertical-to-horizontal change-of-plane and similar transitions in the work as recommended by the waterproofing manufacturer whether shown on the drawings or not.
4. Coordinate work of this Section with Section 07 25 13 to ensure integrity of building envelope at transition between waterproofing and air barrier for air-tight and water-proof performance.

3.4 WATERPROOING FOR PITS AND SUMPS

A. Waterproofing: Provide for pits and sump using the manufacturer's recommended product for the application required. Comply with manufacturer's recommended procedures and apply continuously throughout horizontal and vertical surfaces of pits and sumps with membrane firmly supported on prepared subgrade. Ensure required overlap at seams. Roll seams and otherwise ensure formation of a permanent water-tight bond resistant to hydrostatic pressure.
1. Ancillary Components: Provide as necessary for specific conditions and details encountered in the course of the work; comply with manufacturer's recommended details and practices as recommended by the waterproofing manufacturer whether shown on the drawings or not.
2. Provide complete accessory components to seal and reinforce inside and outside corners, vertical-to-horizontal change-of-plane and similar transitions in the work
3. Penetrations: Following application of initial layer of waterproofing, recoat waterproofing with liquid membrane, and thread a single piece of sheet membrane over the penetrant and embed it in the liquid membrane; cut-and-lapped sheets are not acceptable. Size the sheet to allow a minimum 10 inches over-lap onto the penetrated surface. Over-coat the sheet with an additional application of liquid membrane lapped 3 inches onto the penetrant.
   a. Following placement of concrete per Contract requirements, inspect penetrations that remain visible for stability and complete bonding with concrete. Correct poorly bonded items as necessary to ensure integrity of waterproofing.
4. Protection Board: Provide over waterproofing not indicated to have drainage composite.

3.5 DRAINAGE COMPOSITE

A. Drainage Composite: Apply over insulation at vertical plane of subgrade walls, pits and sumps or other substrate where indicated; secure in-place to prevent movement and dislocation due to conditions of service and ensure continuity of protective cover and water flow with drainage continuity vertically and horizontally across adjacent sheets as necessary for effective collection and conduct of water to disposal point. Provide tubing, pipe, fittings and all accessory components necessary for conveyance of water collected within composite drainage assembly and conduct it to required discharge point.
   1. Coordinate with formwork and concrete work for penetration details necessary to complete drainage system as required.
   2. Provide protection board for any waterproofing not otherwise covered with an approved protective covering as recommended by the manufacturer.

B. Provide rigid insulation over waterproofing in locations required; coordinate with Section 07 21 00.

3.6 FIELD QUALITY CONTROL

A. The Contractor shall be responsible for ensuring that the waterproofing materials manufacturer's Field Quality Control Agent is present at the Project for the following milestones as a minimum.
   1. Required Site Visits: Pre-Installation Conference, review of installation conditions, start of waterproofing work and at completion of work. Manufacturer's agent shall also visit the site not less than 3 times while waterproofing work is actively in progress without prior notice to the Contractor and at such intervals that they have observed and inspected execution of typical terminations and penetrations and critical details (if any).
   2. At completion of the work Contractor shall provide manufacturer's certification that the work of this Section complies with all of the manufacturer's warranty requirements and has been installed in accordance with manufacturer's accepted practices. Contractor shall notify the Architect of any exclusions and exceptions in this certification and provide corrective work to eliminate each exclusion and exception at no additional cost to the Owner.

B. The Owner may have an independent waterproofing consultant on site during the course of the work of this Section. Contractor shall assist the Owner's consultant in observing the work and cooperate fully with this effort including but not limited to providing advance notice of work schedules, material information and samples as the Consultant may determine to be necessary to verify compliance of the work with the Contract requirements.

END OF SECTION

SECTION 07 19 00 – WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for vapor permeable treatments to protect cementitious and masonry substrates from weather exposure, soiling and other agents.

B. RELATED REQUIREMENTS
1. Sections specifying Volatile Organic Compound (VOC) Content restrictions and limitations.
2. Section 01 81 13 .71 Sustainable Design Requirements.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code,""CALGreen."

B. California Code of Regulations, Title 24 Part 2, California Building Code (CBC), International Building Code with California Amendments.ASTM International:
1. ASTM C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
2. ASTM D 1653, Standard Test Methods for Water Vapor Transmission of Organic Coating Films.
3. ASTM D 6490, Standard Test Methods for Water Vapor Transmission of Nonfilm Forming Treatments Used on Cementitious Panels.
4. ASTM D 6578, Standard Practice for Determination of Graffiti Resistance.
5. ASTM E 514, Standard Testm Metod for Water Penetration and Leakage through Masonry.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequencing: Comply with sequence and schedule requirements of Section 04 22 00 for application of water repellent and graffiti control treatment.
1. Unless otherwise acceptable, apply water repellent and graffiti control treatment subsequent to completion of sealant installation.
2. Coordinate application schedule and installation of materials that may be adversely affected or damaged in the course of applying the required treatments to eliminate that potential or otherwise protect the work to prevent any damage.

1.4 SUBMITTALS

A. Product Data: Required for each type of water repellent to be incorporated into the Work; include manufacturer's installation instructions.

B. Supporting lab test data confirming material performance and characteristics as specified herein. ASTM E 514 results must be from a qualified, independent lab.CALGreen Submittals:

1. Product Data, VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with specified limits.
2. Low/No VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

C. Shop Drawings: Annotate building elevations to indicate proposed location for break between graffiti treatment and water repellant.

D. Samples: Two 12 by 12 inches of each substrate to receive repellent treatment; treat half of each sample.

E. Product Certificates, for each water repellant type, from manufacturer.

F. Quality Assurance Submittals: Demonstrate specified Installer qualifications, manufacturer certificates and mock-up.

G. Field Quality Control Reports: Provide manufacturer's representative's written inspection report.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Five years successful experience with products and applications similar to those required for this Project and approved by water repellent manufacturer.

B. Certification: Signed by waterproofing manufacturer that required products are suitable for assemblies, and applications indicated.

C. Mock-Up: As a prerequisite to acceptance of materials for use on Project, treat the integrated exterior mock-up and on additional areas when directed, with graffiti control and water repellent treatments to demonstrate visual and physical effect of treatment; minimum area of 100 square feet; include with mock-up a demonstration of any protective coatings and covers proposed for use in the final work.

1.6 FIELD CONDITIONS

A. Environmental Requirements: 24 Hours prior to and following application; ambient and substrate temperature above 50 degrees F, and within the limits recommended by water repellent manufacturer.

1.7 EXTRA STOCK

A. Furnish extra materials that match products installed. Package coating materials in unopened, factory-sealed containers for storage and identify with labels describing contents.
1. Quantity: Five (5) percent, but not less than 1 gallon of each material installed.
2. Provide two (2) copies of manufacturer's mixing instructions in addition to those included on the product labels.

1.8 WARRANTY

A. Special Warranty: Signed by Manufacturer and Applicator; Installation shall remain water repellent and not deteriorate in excess of manufacturer's written representations:
   1. Water Repellent (general):
      a. Vertical Applications: Ten (10) years minimum.
      b. Horizontal Applications: Five (5) years minimum.
   2. Evonik Protectosil Chem-TRETE PB 350: Twenty (20) years.
   3. Graffiti Resistant Coating: Five (5) years minimum.
   4. Provide all necessary products and labor for reapplication of failed repellent at no cost to Owner.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers and coatings.

B. Acceptable materials are penetrating reactive silane formulation only. Siloxane, silicon silicone, acrylic and silane-siloxane emulsions are not acceptable.

C. Performance Testing of Water Repellents: Water repellent products must meet or exceed listed performance criteria:
   1. Water Leakage of CMU: Minimum 99 percent reduction over the control wall per ASM E 514.
      a. Control wall to have a leakage rate of at least 6.0 liters per hour before coating application.
   2. Water Absorption of CMU: Minimum 89 percent reduction water absorption per ASTM C 140, 24-hour submersion test.
   3. Water Absorption of Concrete:
   4. Moisture Vapor Permeability: Minimum 95 percent breathability of coating per ASM C 1653 Requirement applies to water repellents and anti-graffiti coatings on all min substates.
   5. Note ASTM E 96 testing is not an acceptable substitution for ASTM D 1653 test.

D. Performance Testing of Anti-Graffiti Coatings: Anti-Graffiti Coating products must meet or exceed listed performance criteria:
   1. Graffiti Resistance: Cleanability Level 3 after 25 cycles per ASTM D6578.
   2. Breathability: Greater than 90 percent breathable per ASTM D 6490.

2.2 MANUFACTURERS

A. Basis of Design Products, as manufactured by Evonik Industries, www.protectosil.com:
   1. Clear Penetrating Water Repellent: Concentrated alkytrialkoxy silane for dilution with water before application. Do not dilute concentrate above a maximum VOC concentration of 50 grams per liter, 19:1 for the listed product.
      a. Subject to compliance with Project requirements provide Evonik Aqua-Trete Concentrate, Chem-Trete PB 100or approved. Provide product of a single manufacturer for water repellent and graffiti control treatment.

2. Graffiti Control Treatment: Breathable, penetrating aqueous silane specifically formulated by the manufacturer as a graffiti control treatment; Evonik Industries Protectosil Anti-Graffiti.
3. Effective Control: As determined using ASTM D 6578 all media types shall be removed without exceeding Level 3 cleaning procedure.

B. Acceptable Alternate:
1. Graffiti Master Products manufactured by This Stuff Works, In. TSW), Sacramento, CA distributed through Kelly-Moore Paints.

C. Subject to compliance with requirements, provide named products or equivalent products formulated for the specified substrates.
1. Substitutions: Per Division 01 25 00 requirements.

2.3 MATERIALS

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate is clean, free of contaminants, and surface treatments that could impair water repellant performance. Provide remedial Work necessary to eliminate unacceptable conditions. Test substrate moisture content and verify compliance with repellent manufacturer's recommended limits for products whose performance may be reduced by moisture contained in the substrate at time of application.

3.2 PREPARATION

A. General: Remove plates, plaques, and similar façade elements in place and not to receive coating; install surface protection where element size, weight or attachment render removal impractical.
1. Re-install elements after coating is complete.

B. Cleaning: Remove substances that could impair coatings efficacy, including oil, grease and surface contaminants prior to applying coatings.
1. Schedule cleaning and coating application so dust and other contaminants from cleaning processes will not fall on wet, newly coated surfaces.
2. Remove dirt and surface contaminants, excess mortar, efflorescence, form release agents, curing compounds, silicone and polymer coatings that may inhibit the coating’s required penetration.
3. Employ surface cleaning including abrasive cleaning methods as approved by coating manufacturer and as accepted by Architect during mock-up process; use of muriatic acids is prohibited.

C. Substrate Repair: Properly repair all mortar joints voids and bee holes, repair cracks as field directed with suitable cementitious mortar or polyurethane joint sealant.

D. Coating Preparation: Prepare coatings according to manufacturer’s written instructions.
1. Maintain containers and coatings in a clean, contaminant-free condition.

E. Adjoining Work Protection: Protect aluminum, glass and sealant bond surfaces from anti-water repellent and graffiti spillage or blow-over; protect landscaping from product exposure.

F. Sealant Coordination: Verify all patching and joint sealants have been placed and fully cured prior to applying water repellent / anti-graffiti coating; all re-pointing must be completed cured a minimum of three days prior to water repellent / anti-graffiti coating application.

G. Inspection: Applicator, Project Inspector, and Manufacturer's Representative shall inspect surfaces prior to coating application; Manufacturer's Rep shall submit a pre-application letter to the Applicator to be presented to the General Contractor detailing the inspection and any identifying conditions that may adversely effect water repellent / anti-graffiti coating's application.

3.3 Cure Time: Allow minimum 28-day cure for CMU, plaster and concrete substates; do not coat surfaces if substate moisture content exceeds that permitted in manufacturer's written instruction.APPLICATION

A. Apply a heavy saturation spray coating of water repellent on above grade masonry and cast-in-place concrete surfaces using high-volume, low-pressure spray equipment. Comply with manufacturer's instructions and recommendations, using airless spraying procedure unless otherwise indicated.

B. Precast Concrete: Initial application of water repellent shall be completed prior to installation of units. Mask sealant-bond surfaces to prevent migration of water repellent onto joint surfaces.

C. Apply a second saturation spray coating, repeating first application. Comply with manufacturer's instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if printed recommendations are not applicable to project conditions.

D. Anti-Graffiti treatment: Apply to all exposed concrete, precast concrete and masonry surfaces from finish grade to an approximate height of ten feet above finish grade. Terminate treatment at a natural break in the work as indicated in approved submittal. Coordinate application of water repellent and anti-graffiti treatment, ensure compatibility between the two and the final application of each does not alter the appearance of the building.

E. Cover adjoining and nearby surfaces and materials where there is possibility of damage or alteration in appearance due to water repellent being deposited on surfaces. Cover live plant materials with drop cloths. Clean water repellent from adjoining surfaces immediately after spillage. Comply with manufacturer's recommendations for cleaning.

F. Where other work cannot be sequenced to eliminate potential for damage due to work of this Section provide effective protection of materials, and adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces and materials where there is possibility of damage or alteration in appearance due to water repellent being deposited on surfaces. Cover live plant materials with drop cloths. Clean water repellent from adjoining surfaces immediately after spillage. Comply with manufacturer's recommendations for cleaning.

G. Handle and apply materials in accordance with manufacturer's recommendations on ventilation, disposal, building occupant protection, pedestrian and adjacent material safety measures.

1. Follow manufacturer’s coverage rate guidelines for each product.

H. Do not apply coatings to a hot (exposed to direct sunlight) wall or where darkening may occur.

3.4 FIELD QUALITY CONTROL

A. Manufacturer’s Representative shall perform Rilem Uptake Tube test after water repellent application to confirm water repellent’s performance.
1. Schedule testing in advance for Owner and Architect attendance and observation.
2. Allow cure time as recommended by manufacturer for substrate and application conditions; conduct tests per manufacturer’s performance and warranty requirements.

B. Spray-apply coated surfaces with clear water to reveal any areas having no or deficient product application; when surface is thoroughly dry, re-apply product to any area having exhibited moisture absorption.

END OF SECTION

SECTION 07 21 00 – THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes providing building insulation at grade-support concrete slabs, exterior walls and soffits throughout the building, including:

1. Extruded polystyrene foam-plastic board insulation.
2. Glass-fiber blanket insulation.
3. Glass-fiber board insulation.
4. Mineral-wool blanket insulation.
5. Mineral-wool board insulation.

B. Insulation at Roof Assemblies: As specified in Section 07 54 23 for roof assembly types required.

C. Definitions:
1. Thermal Resistance: R-Value; rate of heat flow through one square foot of homogenous material one inch thick.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Coordinate work of this Section with all other aspects of exterior envelope construction including but not limited to proactive coordination of work sequence, provisions to prevent delay due to seasonal weather conditions that may impact work, and requirements for alternative insulation materials to maintain envelope thermal performance.

1.3 SUBMITTALS

A. Product Data: Required for each material, manufactured product, and accessory to be incorporated into the Work.

B. Shop Drawings: Indicate insulation types scheduled for each assembly at locations required, Including locations where spray-applied plastic foam insulation will be provided for compliance with requirements to maintain the continuity and integrity of the building thermal and air barrier envelopes.

1.4 FIELD CONDITIONS

A. Environmental Requirements: Perform Work only when existing and forecasted weather conditions comply with manufacturers' recommendations and warranty requirements.

B. Provide temporary measures necessary due to Project Schedule, seasonal variations and prevailing weather to establish conditions required for successful application of the insulation products required for the Work including but not necessarily limited to temporary sheltering of work from precipitation, mitigation of temperature extremes and all other controls needed for conditions prevailing at the time of installation at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Building Envelope Thermal Performance: Conduct work of this Section to ensure compliance with California Energy Code for R-Value continuity. Provide each type of insulation necessary and revise type required and installation method or sequence proposed so as to ensure compliance.

B. Building Envelope Air Barrier Performance: Provide spray-applied foam plastic insulation at vertical and horizontal assemblies as necessary to ensure air barrier continuity and integrity complying with Performance Requirements in Section 07 25 13.

2.2 MATERIALS

A. Insulation: Thermal Insulation shall comply with California Green Building Standards Code Title 24, Chapter 11 Section 5.504.4.7.
   1. All insulation shall meet the requirements of the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers” Version 1.2, January 2017.
      a. Provide verification of compliance as required by 5.504.4.7.1.
   2. Certified by manufacturer and independent laboratory as free of asbestos fibers and having no added urea-formaldehyde.
   3. Surface Burning Characteristics: ASTM E 84.
   4. Fire Resistance Ratings: ASTM E 119.
   5. Combustion Characteristics: ASTM E 136.
   6. Provide insulation in thickness indicated. Thermal resistance values shall be derivative from the material thickness required.

B. Glass Fiber Insulations: Formaldehyde free and contain a minimum 25 percent of recycled material, flame spread 25, and smoke development 50 rating, and comply with individual product specifications.
   1. Unfaced Glass Fiber or Mineral Wool Batt or Blanket: ASTM C 665, Type I, formaldehyde free, R-value not less than 10 for 3.5-inch thickness; provide insulation in actual thickness indicated and as necessary to comply with total R-value required. Contractor option to provide glass fiber or miner wool
   2. Fire Safing: ASTM C 612, passes ASTM E 13, Class 4 semi-rigid batts.
   3. Spray-In Glass Fiber Insulation: ASTM C 764, Johns Manville JM Spider Custom Insulation.
   4. Unfaced Glass Fiber Board Insulation: ASTM C 612, Category 1, and Category 2, boards as required, and as necessary for conditions of installation, R-value 4.13 at 75 degrees F.

C. Mineral Wool: Provide products in thickness required of a single manufacturer for all mineral wool insulations required, basis of design is products of Rockwool unless specified otherwise.
   1. Blanket: ASTM 665 Type 1, (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics; 2 PCF density, Comfortbatt thermal batt insulation, having wood stud thermal performance as follows:
      a. R-15 3.5-inch thickness.
      b. R-23, 5.5-inch thickness.
      c. R-30 at 7.25-inch thickness.

2. Semi-rigid Board Insulation: ASTM C 612 Type IV B; CavityRock DD, dual density 6.2 outer and 4.1 inner pounds per cubic foot having ASTM C 518 per inch R-value of 4.3, at select locations as required provide monolithic density 11 pounds per cubic foot ComfortBoard 110 having an R-value of 4.0.
3. Fire Safing: ASTM C 612 Type IV, A pass ASTM E 13, semi-rigid batts Roxul SAFE.
4. Curtain Wall Spandrel: ASTM C 612 Type IV; 8 PCF density, ASTM E 96 perm rating of 32, per inch R-value 4.2 – provide thickness necessary for required R value Roxul Curtainrock, Thermafiber or approved.

D. Insulation for Miscellaneous Voids:
1. Spray Foam Insulation: Permanently flexible, closed-cell expanding foam stable and inert upon cure, HeatLOK HFO Pro by Huntsman Building Solutions may be acceptable.
a. CFC Content: Blowing agents and similar compounds used to produce and install insulation shall cause no adverse effect on the atmosphere.
b. Asbestos Content: Certified by manufacturer and independent laboratory to be asbestos free.
c. Free of PBDE; Green Guard certified for use in schools.
d. Permeance: 0.79 Perms evaluated per ASTM E 96 at 1.5-inch thickness.
e. Surface Burning and Smoke Development: ASTM E 84 Class 1.

E. Insulation Tape: Aluminum face construction tape recommended by the manufacturer for bonding and sealing joints between abutting rigid and semi-rigid board insulation units and similar applications.

F. Adhesive for Insulation: Recommended by insulation manufacturer and comply, compatible with weather resistant air barrier materials and with fire performance characteristics, and having demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

G. Mechanical Attachment, Insulation Anchors, Spindles and Standoffs: Provide approved fastener type and head configuration recommended by the insulation manufacturer for substrate type and conditions of service required for each insulated assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which insulation work is to be performed. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Clean substrates of substances harmful to insulation, remove projections that could damage insulation or adversely affect its performance.

3.2 INSTALLATION

A. For thermal insulation provided as work of this Section to fulfill the requirements of the Contract Documents, and perform acceptably, transmission of heat through assemblies to be insulated must be controlled and reduced to the extent represented by the thermal resistance value intended for the overall assembly. To achieve this objective the Contractor shall

exercise special care in the installation of thermal insulation including but not limited to the following components.

1. Thermal bridges can occur where components extend unbroken through an insulated assembly and at similar locations. Identify potential thermal bridges in the Work and propose modifications to eliminate this potential.
2. Ensure that insulation installed in the Work is continuous throughout the area required and placed so as to achieve the optimum resistance to heat flow through the insulated assembly.

B. Comply with manufacturer's instructions for installation. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

C. Extend insulation in thickness indicated, and as necessary for total R-value required over entire area to be insulated. Remove projections that interfere with placement. Cut and fit tightly around obstructions, and fill voids with insulation. Provide tight-fitting joints between abutting insulation units and to adjacent construction.

D. Mineral Wool Insulation: Provide for positive restraint of insulation by mechanical attachment or other acceptable means, friction fitting is not acceptable.
1. Provide where insulation is required in exterior wall cavity indicated as fire resistive assembly.
2. Provide at areas where insulation is indicated at exterior soffits.
3. Batts and Fire Safing: Provide for positive restraint of insulation by mechanical attachment or other acceptable means, friction fitting is not acceptable. Provide tight-fitting joints between abutting insulation units and to adjacent construction.

E. Batt Insulation at Framed Exterior Walls, Curbs and Other Assemblies as Indicated: Specified unfaced glass fiber or mineral wool batts in the thickness indicated in exterior wall types,
1. Coordinate with Section 07 26 00 for application of vapor barrier on warm-in-winter side where exterior framed walls are indicated to have batt insulation with no outside rigid insulation.
2. Batts and Fire Safing: Provide for positive restraint of insulation by mechanical attachment or other acceptable means, friction fitting is not acceptable. Provide tight-fitting joints between abutting insulation units and to adjacent construction.

F. Fire Safing: Provide as necessary to ensure non-combustible closure between horizontal structure and vertical assemblies.

G. Curtain Wall Spandrel Panel Insulation: Mineral wool semi-rigid board as indicated on A504 and A521 and elsewhere in the drawings in thickness necessary to achieve R13.

H. Protect installed insulation from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

PART 4 - INSULATION SCHEDULE

4.1 Thermal Insulation: Values specified here are minimums. Thicker insulation or higher R-Values as noted in Title 24 report shall govern over these values. Provide insulation at all locations required for complete insulation of conditioned spaces.

A. Faced glass fiber batt insulation at all exterior walls, (R-19) minimum.

B. Unfaced glass fiber batt insulation (R-19) between conditioned and non-conditioned interior spaces.

C. Unfaced glass fiber batt insulation (R-19) in cavity walls.

D. Mineral Wool insulation (R-30) in exterior soffits and (R-23) behind glulam and solid sawn wood beams.

E. Interior walls and partitions, refer to Section 09 81 00 “Acoustical Insulation”.

F. Fire Safing at rated walls.

END OF SECTION

SECTION 07 24 23 – EXTERIOR PLASTER REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirement for pressure washing repair of existing exterior plaster as indicated and textured elastomeric finish.

B. Unit Prices: Required for work of this Section.. Contractor shall anticipate a variety of assembly conditions will be encountered and provide a single unit price for repairs without regard for deviations in assembly components and as necessary to match adjacent work. Unit Price shall include removal of existing plasterwork as necessary to affect required repairs.
   1. Price per square foot for infill and corrective inclusive for work categories A and B.
   2. Price per lineal foot for crack repair inclusive for work categories C, D and E.
   3. Price per square foot for deep repair as required at eastern pilaster capital.

1.2 DEFINITIONS

A. Water Spray Pressures: For use in describing Work of this Section; measured at the nozzle.
   1. Medium Pressure: 500 to 800 psi; 3 to 6 gallons per minute

1.3 SYSTEM DESCRIPTION

A. Design Requirements: The Contract Documents indicate the general location for the various categories of work required. Details of conditions are not shown; final resolution of details shall be work of this Section such that the completed installation is durable and permanently weathertight and achieves a satisfactory uniformity in appearance for the overall building. Where necessary due to variable assembly conditions details shall be revised without significant alteration to appearance as approved by the Architect. Such work shall be considered within the scope required by the Contract and shall not be used as a basis for Claims or other modification to the Contract.
   1. Work Category A Infill of Holes and Voids: Prepare lacunae and fill with the specified Repair Mortar or Void Filler as necessary for each condition.
   2. Work Category B Remedial and Corrective Work: Where substrate profile and texture does not match similar adjacent surface remove material to a depth sufficient to correct the profile and texture to match adjacent using the specified repair mortar. Where substrate is friable or poorly bonded, remove the material to sound substrate and as necessary for infill with specified repair mortar.
   3. Crack Repair Work Categories:
      a. Category C Small Cracks: Less than 0.0625 inch in width; fill with specified knife grade mastic as a pretreatment prior to general coating application.
      b. Category D Medium Cracks: Greater than 0.0625 inch and up to 0.125 inch in width; grind crack to 0.25-inch width and fill with specified filling compound.
      c. Category E Large Cracks: Over 0.125 inch in width; prepare as necessary for conditions encountered and to establish required joint profile and fill with the specified polyurethane sealant.
   4. Deep Repair: Provide as required for eastern most pilaster capital on North elevation.

5. Elastomeric Finish: Prepare surfaces and apply a non-textured base coat and textured finish coat of the specified permeable elastomeric coating to achieve a uniform appearance for entire building façade with textured finish per the approved mock-up.

B. Performance Requirements: Integrate remedial work with existing stucco to remain to provide a durable contiguous weather-tight envelope. Provide uniform texture and appearance in finished work as established with the approved mock-up.

1.4 SUBMITTALS

A. Product Data: Required for all components and accessories.

B. Finish Samples: Nominal 8 by 10-inch samples demonstrating the range of textures and colors achievable with the elastomeric finish for initial selection. Provide not fewer than four sample sets for initial selection purposes.
1. Submit sufficient number of samples to demonstrate color and finish deviations to be expected in the Work but not less than two.

C. Work Plan: Demonstrate method for complying with requirements for each Work Category and process adapted to specific Project conditions encountered include a narrative for the work processes to be performed and the products to be incorporated for each Work Category.
1. Document experience and skill for proper use of grinders and similar power tools.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Demonstrate successful experience with products and processes proposed to be provided as work of this Section compliance with qualification requirements and the following.
1. Installer: Certified by the manufacturer of products to be utilized in work of this Section. Local applicators identified by the manufacturer as having experience with their products include but are not necessarily limited to Pioneer Waterproofing and D & R Masonry.
2. Installation Forman: Five jobs completed by installer not less than three years prior to bid date for the Project, list products installed, General Contractor, Owner, Architect, and Warranty history.
3. Nozzle Operator for Power Washing: SSPC C-7 Certified abrasive blast nozzle operator or other acceptable credentials.

B. Manufacturer: Provide a single source of supply for products used for crack repair, filling of voids and correction of surface conditions and elastomeric finish system.

C. Pre-Installation Meeting: As required in Section 01200; Manufacturer's field representative shall attend, sequence as necessary for proper coordination with the Work.

D. Mock-Up: Following initial selection of color and texture demonstrate finish texture and color on prepared substrate. Mock-up shall include stucco needing only surface preparation without remedial work and surfaces requiring Category B remedial or corrective work. Approved mock-up shall establish the standard to be used in evaluating the final work.

E. Regulatory Requirements: Cleaning operations and disposal of cleaning solution and rinse water in compliance with requirements of agencies having jurisdiction:

1.6 PROJECT CONDITIONS

A. Locations of the Work Categories indicated are diagrammatic and not intended to document exact size and configuration of any given area to receive a given type of work. Work areas are distributed over wide portions of the building facades, suitable access shall be provided as work of this Section including reasonable opportunity for observation of the work by the Owner and the Architect as directed.

1.7 WARRANTY

A. Special Warranty: Signed by manufacturer, and installer, work of this Section will remain free from defects in materials and workmanship, not deteriorate in excess of normal weathering and remain in compliance with Project requirements for a period of 5 years and provide for correction of defective work and material at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Basis of Design Manufacturer: Mastic, repair mortar, filler, sealant, primer, finish coating and accessory components of Edison Coatings, Inc.

B. Crack Repair: The following products of Edison Coatings, Inc. are the basis of design for the Work Categories required and as recommended by the manufacturer for specific Project conditions encountered.
1. Knife Grade Mastic: Cracks less than 0.0625 inch in width; Elasto-Mastic 352.
2. Filling Compound: Cracks 0.0625 to 0.125 inch in width; Elasto-Fill 354.
3. Polyurethane Sealant: Cracks greater than 0.125 inch in width; Hydrospan ES-400 GG.

C. Repair Mortar: Edison Coatings Custom System 45 Type ST and incorporating Restoration Latex RL-1 acrylic modifier.
1. Deep Repair Mortar: Custom System 45 Type TC or BR as necessary for compatibility of physical characteristics of substrate materials and in-fill repair.

D. Elastomeric Finish: Provide smooth base coat and textured finish coat and primer where necessary due to substrate conditions encountered; color and texture shall match approved mock-up.
1. Primer: Edison Coatings, Inc. 342 acrylic primer/Sealer/Consolidant.
2. Elastomeric Finish: Edison Coatings Elastowall 351 provide media as recommended by coating manufacturer to achieve finish texture required.

E. Accessories: 316 series stainless steel as necessary for conditions encountered in the Work. for internal reinforcement of remedial work and to secure new work to stable back-up masonry.
1. Reinforcing: Diamond mesh lath in shape required and recommended by manufacturer, allow full plaster encasement.
2. Dowels: Threaded to enhance mechanical mortar bond.
3. Masonry Pins: Helifix anchor, Weston, Ontario, Canada. Use dry without epoxy.

F. Cleaning Solution: Water or dilute solution of water and chemical cleaner where necessary to establish substrate conditions acceptable for subsequent remedial and finish work.

2.2 EQUIPMENT

A. Spray Equipment: Controlled application of water at specified rates and pressures measured at nozzle.

B. Brushes: Natural fiber bristle.

C. Grinders: Power operated hand saws and grinders based on installer's successful prior experience and demonstrated ability of operators to use tools without damage to masonry.

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with applicable requirements of ASTM D 5703 and requirements of this Section for pressure washing of stucco work. Where water washing and surface scrubbing cannot establish required substrate condition a dilute detergent solution shall be provided.

3.2 PLASTER REPAIR

A. Perform each Category of Work to comply with System Description requirements, recommendations of the manufacturer of remedial, corrective and finish products to be applied as work of this Section and as necessary for specific conditions encountered.
   1. Provide surface examination of areas where there is evidence of possible bond failure by surface sounding and other appropriate means. Provide remedial and corrective work of the type required for the conditions encountered. Work in excess of base bid quantities will be conducted on a Unit Price basis as provided for modifications to the Contract.

B. Prevent damage to building and work to remain cover exposed terminations and provide other temporary protection to prevent water infiltration behind the system.

END OF SECTION

SECTION 07 25 13 – WEATHER RESISTIVE AIR BARRIER ASSEMBLY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for component products and completed system within the building enclosure assembly as a barrier to air infiltration and exfiltration and complying with the System Description of this Section.
   1. Interior vapor barrier is work of Section 07 26 00; provide products of a single manufacturer throughout the Project for all assembly types.

B. Definitions:
   1. For component indicated as WRB weather resistive barrier, Air Barrier and similar terms, Transition: Interpreted to mean anticipated locations where barrier assembly and all accessory components necessary to accommodate a change in substrate material, profile, substrate character accommodate movement and any other conditions are required. Provide consistent accommodation at all similar transitions in the Work whether indicated or not at no additional cost to the Owner.
   2. Transition. Air Barrier Transition and Similar Terms: Interpreted to mean anticipated locations where air barrier assembly and all accessory components necessary to accommodate a change in substrate material, profile, substrate character and any other conditions are required. Provide consistent accommodation at all similar transitions in the Work whether indicated or not at no additional cost to the Owner.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Coordinate work of this Section with all other aspects of exterior envelope construction including but not limited to proactive coordination of work sequence, provisions to prevent delay due to seasonal weather conditions that may impact work, and requirements for alternative insulation materials to maintain envelope thermal performance and resistance to air infiltration and exfiltration.
   1. Pre-Installation Field Samples: Evaluated with Architect and technical representative of air barrier manufacturer present, prior to final approval of product for use on Project. Demonstrate substrate preparation, barrier application and evaluation of in-service performance. Locate and evaluate samples as directed.
   2. Temporary measures for mitigation of and protection from environment conditions outside of manufacturer's recommendations for material installation.

B. Sequence Work to minimize potential for damage to installed air barrier due to subsequent construction activities and exposure to weather. Anticipate environmental conditions necessary for successful application of air barrier system; provide temporary facilities necessary to mitigate adverse environmental conditions.
   1. Field Testing of Pre-construction Work: Performed prior to installation of cladding and other material covering barrier but with all types of penetrations in place.
   2. Pre-application of Air Barrier: Air barrier application to sheathing in advance of installation and all similar prefabrication processes, requires prior approval; submit complete, detailed narrative for proposed process and sequence and evidence of previous successful implementation of means and methods proposed for the Work.

1.3 SUBMITTALS

A. Product Data: Demonstrate the manufacturer of the components provided as work of this Section for the air barrier produces a comprehensive range of components and accessories for complete assemblies for the conditions and details that will be encountered during installation of the Work. Document each material and accessory component of air barrier assembly to be incorporated into the Work.

B. Barrier Manufacturer's Certification: Proposed products comply with specification requirements, are compatible with substrates, suitable for barrier assembly type and performance required, and appropriate for the anticipated service environment.
   1. Test Reports: Current product formulation, demonstrate compliance with requirements for each application proposed, and compatibility with substrate and adjacent components.
      a. Identify movement capacity of barrier components subject to movement in-service in the completed work.
   2. Quality Assurance Agent's review and approval of Shop Drawings.

C. Shop Drawings: Prepared by the installer with review and approval by the manufacturer's Quality Assurance Agent. Limn the actual products and assemblies utilized in the Work. Identify barrier assembly, component products and the products and materials to which the barrier products are applied to or integrated with.
   1. Specific Project Details: Transitions, termination, and through-penetrations (including but not limited to fastener and anchor penetrations) of air barrier assembly not adequately documented by manufacturer's standard assembly details.
   2. Typical Conditions:
      a. Openings for fenestration coordinated with work of Section 08 32 13, Section 08 41 00, Section 08 42 29, and Section 08 44 00.
      b. Secondary supports and attachments for unit masonry work of Section 04 22 00 and cladding assemblies of Section 09 24 00.
      c. Accommodation for movement due to structure deflection and dynamic joints.
      d. Roof edge terminations and through-penetrations coordinated with work of Section 07 54 19; give particular attention to transition details for asphalt bearing materials and other non-compatible components.
      e. Areas having limited access complicating normal installation means, sequence or materials selection.
   3. Means and Methods: Submit as required for pre-application means and methods.

D. QUALITY ASSURANCE
   1. Installer Qualifications.
   2. Manufacturer Field Quality Control Agent qualifications and authorization.
   3. Pre-Installation field tests.
   4. Special Warranty.

1.4 QUALITY ASSURANCE

A. Manufacturer: Produce a comprehensive range of component products and accessories for complete weather-resistive air barrier assembly suitable for the conditions and details that will be encountered during installation of the Work and complying with Project requirements.
   1. Five years successful presence in this construction market area as a manufacturer of products specifically intended for use as weather-resistive air barrier in assembly types and applications comparable to those required for the Work.

2. Produce barrier products having the required performance characteristics when installed as required for the Work. Provide complete accessory products for assembly transitions, flashing, reinforcing and all specialized conditions and configurations encountered in performance of the Work.
3. Must provide the specified product warranty.

B. Manufacturer's Field Quality Control Agent: Possess expert knowledge of the products being used, air barrier assembly to be installed and details of application including without limitation preparation, installation and warranty requirements. Shall have authority to certify the completed installation qualifies with the manufacturer's requirements for the Project Warranty specified.

C. Installer: Certified by the Air Barrier Association of America (ABBA) and approved by the manufacturer of the air barrier products being applied. Five years successful experience with the installation of the products and complete system of the type required for the Work.
1. Document at least 3 installations of comparable size and complexity to this Project utilizing similar components and assemblies that have been in-service for not less than 2 years. Provide complete service history and contact information.
2. Must provide the specified labor warranty.

D. Pre-Installation Field Samples: Tested with Architect and technical representative of manufacturer present, prior to final approval of barrier products and components for use in the Work. Evaluate installed performance, preparation of substrate conditions, installation methods for compliance with Project requirements, accommodation of movement and dynamic stresses.
1. Adhesion: Evaluate per ASTM D 4541.
2. Air infiltration: Evaluate per ASTM E 1186
3. Water Penetration: Evaluate per ASTM E 1105.

1.5 FIELD CONDITIONS

A. Environmental Requirements: Perform Work only when existing and forecasted weather conditions comply with manufacturers' recommendations and warranty requirements.

B. Provide temporary measures necessary due to Project Schedule, seasonal variations, and prevailing weather to establish conditions required for successful application of the air barrier assembly including but not necessarily limited to temporary sheltering of work from precipitation, mitigation of temperature extremes and all other controls needed for conditions prevailing at the time of installation at no additional cost to the Owner.

C. Coordination with exterior gypsum sheathing work of Section 06 16 43; confirm actual application rate of air barrier on Project specific substrates. Provide quantity necessary to achieve manufacturer's recommended cured thickness regardless of substrate effect on typical spreading rate and product coverage at no additional cost to the Owner.

1.6 WARRANTY

A. Special Warranty: Provide five-year term that materials are free from defects and will perform in accordance with the manufacturer published data. Provide for replacement of defective and non-compliant materials at no additional cost to the Owner.

B. Installer Warranty: Provide two-year labor warranty to remove and reinstall defective materials including concealing assemblies and work that fails to comply with required performance values at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Weather-Resistive Air Barrier: Continuous assembly incorporate with other building enclosure components, including but not limited to, building cladding, fenestration, roofing and components that penetrate or contact the air-barrier, complying with Project requirements including but not limited to this System Description and the terms specified for the Special and Installer Warranties.

1. Products produced by a single manufacturer or certified by the principal manufacturer as compatible with their products, and appropriate for the application required. The installed products complete with all specialized accessory components shall provide a continuous, integrated, weather-resistive, air barrier envelope having the properties and performance characteristics required when evaluated by an acceptable third-party agent per the referenced test methods.
2. Coordinate air barrier components and integrate them with the other components required for the Work to ensure the integrity of the weather-resistive air barrier envelope.
3. Work of this Section includes responsibility for selecting standard and specialized components for the applications required and as recommended by the manufacturer. Due to the variety of product types produced by different manufacturers certain components or products necessary or recommended by the manufacturer to complete the weather-resistive air barrier system may not be identified in the Contract Documents; such components shall be provided at no additional cost to the Owner as needed to complete the work in accordance with the System Description requirements.
4. Anticipate movement in air barrier assembly where there is no solid support, where supports may be subject to movement, where displacement may occur due to dynamic forces and to accommodate differing characteristics of the various components and materials required for the Work.
5. Subject to approval and compliance with Performance Requirements including restriction on combustible materials and limitations for fire propagation potential; spray-applied foam materials may be acceptable as a supplemental component in the air barrier assembly where restricted access, work sequence or other consideration of merit necessitate.

B. Performance Requirements: Weather-resistive, air barrier assembly shall form a continuous envelope that prevents water penetration and air infiltration into the building having the following characteristics.

1. Air Leakage Limit for Installed Air Barrier Assembly: 0.004 cfm/ft2 under dynamic pressure differential not less than 0.3-inch water column (1.57 psf.) when evaluated in the field per ASTM E 2357 test methods for complete assembly and accessories.
   a. Air Permeance: 0.004 CFM per Square Foot at 1.56 PSF pressure differential per ASTM E 2178.
   b. Assembly Performance: ASTM E 2357 pass.
   c. Adhesion in Peel: ASTM C 836 6.5 pli, cohesive failure.
   d. Autonomic Seal: ASTM D 1970 pass Section 7.9.
2. Components demonstrated to be non-flammable when evaluated per ASTM E 119 or components passing ASTM E 84, Class A evaluation for Flame Spread and Smoke

Development and otherwise passing NFPA 285 in the same aggregate assembly complete with all cladding components as required for the Work.

3. Capable of withstanding dynamic forces including but not limited to structural deflection, building settlement, temperature differential, wind and seismic forces and transfer the imposed force to the building structure free of damage and degradation in performance and service life.
   a. Assembly shall not displace adjacent materials under full load.
   b. Permanently flexible components to accommodate the full range of movement due to dynamic forces and where movement in-service is anticipated.
4. Long-term, permanent resistance to exposure to ultraviolet radiation and visible spectrum sun light.

2.2 MANUFACTURED COMPONENTS – BONDED, NON-ASPHALTIC SHEET MEMBRANE

A. Weather Resistive Air Barrier: Non-asphaltic, stable and inert materials; Siga Majvest, and all additional components and accessories necessary for transitions between profiles, materials and orientation, flashing, penetrations, terminations, and all other Project conditions without limitation for the manufacturer's complete barrier assembly complying with requirements of this Section and as otherwise necessary for compliance with System Description. Product systems and assemblies of other manufacturers are acceptable as provided for substitutions in the work.

1. Accessories and Other Components: Approved by manufacturer of the primary air barrier material and recommended for substrates for specific Project applications and conditions encountered in the Work as proposed by the Contractor or their designated agent for work of this Section.
   a. SAM Transitions: Provide approved, non-bituminous, pressure sensitive, self-adhesive membrane component for locations indicated and where recommended by the air/weather barrier manufacturer. Material shall be compatible with sealants, contact surfaces and other adjacent and near-by components and suitable for conditions of service for each application. Provide minimum width to allow 3-inch overlap onto membrane barrier and bonding surface, across each plane at transitions and similar conditions. Siga Wigluv is the basis of design product.
   b. Flashing at Fenestration: Siga Fentrim series tapes are the basis of design.
   c. Tape or other approved adhesive attachment for bonding of membrane to supporting construction; provide types, primer and accessories as necessary for application to varying substrate materials and conditions as required.

2.3 MANUFACTURED COMPONENTS – FLUID-APPLIED BONDED MEMBRANE

A. The following manufacturers may offer products and systems equal to the basis of design cited in this Section, the listing herein establishes approval of neither a particular manufacturer nor their products. Subject to compliance with Project requirements fluid-applied, non-asphalt containing air barrier and accessory products of one of the following manufacturers may be acceptable

1. Tremco Inc., 3M, Carlisle and ProSoCo.

B. Air Barrier: Provide a fluid-applied elastomeric barrier and components necessary for transitions, flashing, penetrations, terminations, primers, preparatory materials and all other Project conditions without limitation for the manufacturer's complete air barrier assembly complying with requirements of this Section. Basis of design is ProSoCo R-guard CAT-5 which shall establish the minimum quality and material characteristics required and as otherwise necessary for compliance with System Description.

1. Membrane Chemistry: Free of asphalt, modified asphalt and bituminous compounds; materials shall have permanent elastomeric performance not dependent on membrane covering. Cured components shall be inert and compatible with multiple sealants, and adhesives as may be necessary for installation and performance of complete envelope assemblies
2. Accessories and Other Components: Approved by manufacturer of the primary air barrier materials, and recommended for substrates, Project details and applications required. The complete range of accessory components necessary for the range of details and installation conditions encountered in the Work shall be provided regardless of whether specifically enumerated in the Contract Documents at no additional cost to the Owner
    a. Transition: Generic notation requiring compatible components and materials recommended by the air barrier manufacturer for transition of any type whether between materials, across movement planes or planar-geometric changes without limitation to be provided as required for work of this Section.

C. Spray Foam Insulation: Reference Section 07 21 29.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Substrate is fully cured, free of debris, projections, depressions, and all surface conditions that might impair performance of installed membrane; Provide Work sequence appropriate for installation of the air barrier assembly proposed by the Contractor. Beginning of installation will be interpreted as installer's acceptance of substrate.
1. Provide moisture testing of bonding substrate and demonstrate moisture content is within manufacturer’s prescribed limits.

B. Access to certain areas may be limited due construction sequence, assembly configuration or other causes incidental to performance of the Work. Work of this Section includes adjustment to accessory components and air barrier materials, installation sequence, installation method and other adaptations in the work as necessary to ensure envelope integrity and comply with performance requirements at no additional cost to the Owner.
1. Where construction sequence or space limitations restrict access for installation of manufacturer's typical air barrier components provide approved spray-foam insulation in lieu of other material subject to compatibility with Project conditions.
2. Coordinate with work of Section 07 21 00; ensure compliance of the Work with requirements for thermal performance, weather-resistance and resistance to air infiltration/exfiltration.

3.2 INSTALLATION

A. Weather-resistive Air Barrier Assembly: Complete system installed to comply with System Description and Project requirements. Membrane shall be bonded to supporting substrates and construction free of surface defects including but not limited to wrinkles, sags, punctures, gaps and defects that may reduce in service performance membrane.
1. Joints, Seams and Transitions: Locate over solid support, overlap 4 inches and shingle horizontal joints to shed water. Treat membrane joints, edges, punctures, and penetrations using components per approved submittals and as necessary to ensure compliance with Performance Requirements.

a. Reinforce transitions and ensure continuity of air barrier assembly; seal terminations and penetrations to comply with Performance Requirements.

2. Coordinate with penetrations, anchors, flashing, miscellaneous metal support and similar components that penetrate the air barrier. Reinforce penetrations with air barrier components approved for the purpose and as recommended by the manufacturer as best practice for each condition and penetration encountered. Accommodate anchors necessary for connection of cladding components without adverse effect to required performance of air barrier assembly.
3. Coordinate with insulation work of Section 07 21 00; provide air barrier assembly and related accessories as necessary to form a continuous barrier to air infiltration and exfiltration with all components of exterior cladding assemblies.
4. Coordinate with Section 07 62 00; provide membrane flashing and related accessories as necessary to ensure air barrier and flashing function in an effective and complimentary manner.

3.3 FIELD QUALITY CONTROL

A. Inspection of Air Barrier Installation: Manufacturer's Field Quality Control Agent shall be present at the Project for the following milestones as a minimum.
1. Required Site Visits: Pre-Installation Conference, review of installation conditions, start of air barrier work and at completion. Manufacturer's agent shall also visit the site while work is actively in progress without prior notice to the Contractor and at such intervals that they will have observed and inspected execution of typical terminations and penetrations and seen the work in progress but not fewer than five times.
2. At completion of the work contractor shall provide manufacturer's certification that the work of this Section complies with all of the manufacturer's warranty requirements and has been installed in accordance with manufacturer's accepted practices. Contractor shall notify the Architect of any exclusion and exceptions in this certification and provide corrective work to eliminate each exclusion and exception at no additional cost to the Owner.

B. Installer’s Field Quality Assurance Program: Comply with ABAA protocol unless otherwise acceptable.

C. Field Testing: In addition to whole-building compliance testing the installed air barrier may be evaluated by the Owner’s Quality Control agent for compliance with envelope integrity requirements prior to covering with other work. Non-compliant work shall be subject to corrective measures as necessary to achieve compliance with air leakage rate limits.
1. Testing Methodology: ASTM E 2357, ASTM E 283 and ASTM E 2128 may be used individually or together and with selected modifications as necessary to accommodate Project conditions in the field conditions; additional testing may include the following.
a. Air infiltration: Evaluate per ASTM E 1186
b. Water Penetration: Evaluate per ASTM E 1105.

END OF SECTION

SECTION 07 26 00 – VAPOR CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for materials to provide a continuous barrier to the transmission of water vapor through grade-supported concrete slabs, and a continuous vapor control membrane for select locations required at building wall assemblies.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Schedule to permit coordination with the following.
   1. Concrete Flatwork: Work results for grade support concrete slab including but not necessarily limited to earthwork, below grade building systems, concrete formwork, reinforcing, cast-in-place concrete work and related work.
      a. Coordination with Contractor’s Vapor Emission Control plan and work of Division 9 Sections for applied finish floor covering.
   2. Wall Assemblies: Framing of assemblies indicated to receive a vapor control membrane and related building systems the penetrate or may otherwise influence work of this Section and performance of the installed membrane.

1.3 SUBMITTALS

A. Product data for barrier and control membranes and accessories.

B. Coordinate products utilized in work of this Section with Contractor's Moisture Emission Control Plan.

1.4 SEQUENCE AND SCHEDULING

A. Sequence Work to minimize potential for damage to installed membrane due to subsequent construction activities and exposure to weather.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bonded Vapor Barrier: ASTM E 1745 Class A; Multi-ply polyolefin sheet with special facing to bond the membrane to the structure on contact with freshly place concrete; Sika SikaProof A-08 or GCP Applied Technologies Florprufe 120.

B. Accessories: Approved by manufacturer of primary materials, and recommended for substrates, and applications required.
   1. Adhesives and Tapes: For sealing of membrane seams, flashings, penetrations, and adjoining surfaces.
   2. Provide staples, mechanical fastenings and related accessories per manufacture's recommendations for the applications required.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Substrate is dry, fully cured, smooth, free of debris, projections, depressions, and imperfections that might impair performance of installed membrane; Work has been sequenced for installation of membrane as required. Beginning of installation will be interpreted as installer's acceptance of substrate.

B. Vapor Barrier: For below grade concrete work, coordinate with installation waterproofing and related work; give particular attention to components that must penetrate the vapor barrier and work of each of the following Sections.
   1. Cast-in-Place Concrete, Section 03 30 00.

3.2 INSTALLATION

A. Extend vapor barrier and vapor control membranes throughout each area to be protected from transmission of air or water vapor; install membrane for optimum effectiveness and service life as a barrier to water and air transmission. Secure barrier with adhesive, and mechanical fasteners as indicated and recommended by manufacturer.
   1. Installed Membranes: Free of wrinkles, sags, punctures and defects that may reduce in service performance.

B. Under Grade-Supported Concrete Slab: Provide vapor barrier membrane complying with ASTM E 1643 and project requirements. Un-roll membrane and install contiguously with long edge parallel to direction in which the pour will be made. Overlap and tape seams and penetrations as required. Repair damaged membrane with an additional layer of adhesively applied membrane. Restrain membrane to prevent movement and damage due to placement of reinforcing, concrete accessories and placement of the concrete mix.
   1. Provide aggregate capillary break below the barrier in conformance with the Geotechnical Report and Structural General Notes.

END OF SECTION

SECTION 07 54 19 – POLYVINYL CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for weather-resistant, watertight, single ply polyvinyl chloride (PVC) roofing assembly insulated where required using fully adhered installation and the following:
   1. Accessory roofing materials.
   2. Substrate board.
   3. Roof insulation.
   4. Insulation accessories and cover board.
   5. Asphalt materials.
   6. Walkways.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Coordinate with schedule for work of roof-top mechanical equipment and mechanical screens. Manufacturer's Field Quality Control Agent shall attend in addition to other required parties.
   1. Include representatives of all trades performing work prior to and subsequent to membrane roofing installation whose work may affect roof installation or otherwise pose potential for wear or damage to installed work.
   2. Identify access requirements, nature of work being performed, protection required and procedures to be followed to prevent wear and damage to work of this Section. Include procedures for moving objects weighing more than 50 pounds.
   3. Coordinate with field quality assurance requirements for building envelope resistance to air infiltration; ensure compliance testing can be performed in sequence appropriate to the status of the work and allow for correction of non-compliant without delay to Project Schedule.

B. Sequence and Schedule Work to prevent exposure of installed membrane to construction traffic and minimize exposure to ultra-violet radiation. Complete installation in each area without interruption, including allowances for weather.
   1. Identify temporary facilities and controls to be provided to establish and maintain acceptable substrate conditions for roofing installation and weather protection during the work.

1.3 SUBMITTALS

A. Contractor shall provide certification from the roof manufacturer that submittal information and Project installation details have been reviewed and approved by the roof membrane manufacturer, and the proposed materials and roof system qualifies for the required warranty which will be provided by the manufacturer per requirements of this Section.

B. Product Data: Required for each product to be incorporated into the Work. Provide complete information for the assembly type required.
   1. Manufacturer's complete installation procedures and recommendations for the roof assembly required.

2. Roof membrane Manufacturer's certification of acceptability of insulation and accessory products.
3. Energy Performance: Licensed product of the Cool Roof Rating Council Product Rating Program and a listed EPA Energy Star rated roof.
4. Wind Performance: Test results demonstrating compliance with SPRI Wind Load Design Guide for the required installation and compliance with wind uplift due to open structure configuration.
5. Sample of Warranty complying with Project requirements.
6. Provide data for both means of installation mechanically attached and fully adhered.

C. Shop Drawings: Roof configuration, sheet layout and seaming; detail perimeter, flashing, penetrations, layout of Traffic Path, and special conditions.
1. Demonstrate coordination of roof insulation for required slopes including crickets; annotate insulation plan with thickness and actual slope in fractional inches per foot.
2. Provide annotated roof plans. Where necessary for approval of Regulatory Officials provide the Seal and signature of California Registered PE for roofing assembly resistance to Project wind loads.
   a. Design wind pressure for the specified ANSI/SPRI performance requirements at field and perimeter of roof.
   b. Adhered Installation: Adhesive application pattern and spreading rate recommended by the Manufacturer for attachment of insulation, cover board and membrane.
   c. Membrane seams and seaming methods (machine or hand welding).
3. Coordination drawing verifying compliance with height requirements for membrane terminations and penetrations.

D. Construction staging and installation drawings documenting protection of roof assembly components from damage by construction traffic subsequent to installation.

E. Closeout Submittals: In addition to Record Documents for work of this Section provide complete maintenance guidelines from the roof membrane manufacturer; include all procedures and inspections necessary to maintain the specified warranty and any rider enforce and any best practices that may ensure the Owner of optimal performance from the roof assembly.

F. Quality Assurance Submittals:
1. Installer Qualifications, project history and manufacturer’s certification.
2. Field Reports of membrane manufacturer's representative; compliance with wind resistance performance capacities, field pull test results for fasteners,

1.4 QUALITY ASSURANCE

A. The membrane roof to be incorporated in the Work shall be produced directly by the roof manufacturer named in this specification. Manufacture of the membrane by a licensee or any party other than the named manufacturer is not acceptable. Accessories and ancillary components used in the Work shall be produced or approved by the roof membrane manufacturer and included in the terms of the specified warranty.

B. Manufacturer's Field Quality Control Agent: Possess expert knowledge of the products being used including preparation, installation and warranty requirements. Shall have authority to certify to the Contractor that roofing installation qualifies with the manufacturer's requirements for the Project Warranty specified.

C. Installer: National Roofing Contractors Association NRCA member firm, having not less than ten years successful experience with installation of roofing system similar to that required for the Project and certified as a Sarnafil Elite, Carlisle ESP (Excellence in Single-Ply), Firestone Master Contractor, Johns Manville Pinnacle contractor.
   1. Previous Project Experience: Document three installations completed more than 2 years prior to issuance of the Contract Documents utilizing components of the proposed manufacturer that are comparable to those required for the Work, and similar in scope and complexity. Provide complete contact information, warranty and maintenance history for the installation and demonstrate in-service performance complies with original requirements for the work.
   2. Superintendent for work of this Section: Have minimum of five years' experience with thermoplastic roofing systems, the past three with this firm and possessing expert knowledge of the roofing system required for this Project. The Superintendent shall have direct responsibility for compliance of the work with Project requirements and be on-site at all times the work is in progress.

D. Related Work, including (but not limited to) vapor control membrane, insulation, flashing and counter-flashing, expansion joints, and joint sealers: Assigned to Installer of membrane roofing for single point of responsibility and warranty.

1.5 FIELD CONDITIONS

A. Prevailing and forecast weather conditions within Manufacturer's recommended extremes, and warranty requirements.

B. Where Contractor's Schedule and sequence for the Work result in roof installation occurring when seasonal weather conditions may not comply with the roofing manufacturer's recommendations for the specified assembly provide temporary measures necessary to establish compliant conditions and alternative materials suited to the prevailing conditions at no additional cost to the Project.

C. Delivery of Materials: Original packing with manufacturer's identifying label and demonstrating compliance with inspection and labeling requirements of Regulatory Agencies having jurisdiction over the Work.

1.6 WARRANTY

A. Total Roof Assembly Warranty: For all components of the insulated roof membrane assembly above the structural roof deck. Provide written warranty acceptable to the University and signed by the roof membrane manufacturer, installer and the Contractor. No dollar limit, providing for repair and replacement of roofing assembly and components that fail to remain weather-tight, comply with Contract requirements, deteriorates in excess of manufacturer's representations, or is otherwise determined to be defective, for a period of 20 years.
   1. Wind Rider: Attached to the Roof Warranty providing supplemental coverage for roofing failure due to wind up to and including wind speed of 72 miles per hour.

B. Installer Warranty: For all components of the insulated roof membrane assembly above the structural roof deck. In addition to the Total Roof Assembly Warranty provide a warranty against defective workmanship and providing for correction of work that fails to remain watertight and comply with requirements of this Section for three years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Products complying with Project requirements and produced or approved by manufacturer of primary roofing materials as a sole source. Materials and systems requirements establish minimums only; provide design enhancements and accessories as necessary for the Work to qualify for the warranty required by this specification regardless of whether they are otherwise identified in the Contract Documents and without additional cost to the Project.
   1. All components attached to the structural composite deck shall comply with the Performance Requirements specified in this Section. Provide factory fabricated accessory components for corners, penetrations and all similar conditions in the work.
   2. Membrane Roof: Install assembly to comply with requirements for building envelope resistance to air infiltration; contractor shall have the option of providing a separate air barrier complying with this requirement in lieu of membrane roof compliance.
      a. Comply with roof manufacturer’s minimum height requirements for membrane at terminations and penetrations. Provide coordination submittals to verify compliance with roof manufacturer’s minimum height requirements for membrane terminations and penetrations.
   3. Membrane Roof on Open Structure: May be subject to uplift wind pressure, provide sealed insulation layer and other measures to prevent stress and damage to installed membrane and roof assembly due to open structure.
   4. Revise specific product types and accessory components as necessary for compliance with Section requirements and manufacturer's recommendations for conditions prevailing at the time of installation at no additional cost to the Project.

B. Performance Requirements: Provide a water-tight fully weather-resistant insulated single-ply membrane roof assembly complying with Factory Mutual FM Standard 4474 and the following.
   1. Wind Speed: Criteria indicated in General Structural Notes with an importance factor of 1.15. Roof assembly shall be certified by independent testing agency to resist uplift pressure calculated according to ASCE 7 for the required wind speed and importance factor.
   2. Design Wind Pressure: Positive and negative pressure at field and perimeter locations generated at the design wind speed for roof heights and configuration indicated; ensure assembly resistance to wind uplift due to open structure configuration.
   3. Fastener Pull-out Resistance: Adequate to resist required wind pressure loads with a safety factor of three.

2.2 MANUFACTURERS

A. Roofing System: Basis of Design PVC Roof membrane is Sarnafil G 410 Fully Adhered Roof System, 80 mil. Subject to compliance with Project requirements, equal products by the following manufactures may be acceptable:
   1. Carlisle Sure-Flex PVC.
   2. Firestone.
   3. Johns-Manville.

2.3 MATERIALS

A. Roof Membrane: Product of one manufacturer.

1. Accessories and Other Materials Incorporated in the Complete Roof Assembly: Compatible with membrane, and acceptable to membrane manufacturer.

B. PVC Roof Membrane: ASTM D 4434, Type II, Grade I. Thermoplastic roof PVC membrane, glass fiber or polyester reinforced and complying with the specified performance characteristics.
1. Wind Resistance: Compliance with SPRI Wind Resistance Design Guide.
2. Breaking Strength, ASTM D 751: 110 lbf.; not less than 200 percent elongation.
3. Tear Resistance: ASTM D 1004; 22 lbf.
4. Accelerated Weather Resistance: Pass ASTM G 154.
5. Brittleness Test, ASTM D 2136: Pass @ -40 C.
6. Ozone Resistance, ASTM D 1149: No cracks; seven days at 100 degrees F.
7. Heat Aging, ASTM D 571: Pass Tensile and Elongation.
8. Puncture Resistance: ASTM D 5602 Pass.
9. Membrane Seaming: Lapped per manufacturer specifications and continuously heat welded.
10. Membrane Thickness: 80 mil membrane at all roof locations**.**
11. Membrane Color: EnergySmart White:
    a. Initial solar reflectance of 0.85,
    b. Emittance of 0.86.
    c. Solar reflective index (SRI) of 107.

C. Polyisocyanurate Board: ASTM C1289 Type II, Class 2, Grade 2 including LTTR testing, flame spread 20, and smoke developed 95 (one-inch-thick board).
1. Total Thickness: As indicated and as otherwise necessary to maintain positive slope for drainage.
2. Provide tapered units where necessary for required slope.
3. Board Facing: Fiber reinforced felt facer, Saratherm ISO or coated, polymer-bonded, glass fiber mat, Sarnafil ISO CG as recommended by roof membrane manufacturer for the required installation.

D. Underlayment and Insulation Cover Board: Complies with FM 4470 and ASTM C 1177; 0.625-inch-thick rigid boards with water resistant gypsum core and resin coated fiberglass mat facings acceptable to the roofing manufacturer for the installation required and eligible for the specified Project warranty.

E. Accessories: Products of or recommended by membrane manufacturer.
1. Planar Transition, Flashing and Accessories: As indicated, and recommended by manufacturer for installation required; includes adhesives, tapes and other seals.
2. Membrane Flashing: Field membrane sheet or accessory product as necessary for warranty requirements and per membrane manufacturer's recommended best practices.
    a. Membrane Flashing Accessories: Provide prefabricated components for roof penetrations, inside and outside corners, penetration boots and similar details, field fabricated work is not acceptable where the manufacturer offers prefabricated components.
    b. Provide metal components with factory-applied thermoplastic membrane for welded joining with other membrane components.
3. Membrane Adhesive: Product recommended for prevailing conditions at the time of installation for bonding substrates indicated and complying with performance requirements.
4. Mechanical Fasteners: Metal plates, caps, battens, fasteners, and accessories, for substrates indicated, complying with performance requirements, and recommended by membrane manufacturer.

5. Traffic Path: Manufacturer's flexible pads, same color as roof membrane with similar thermal movement characteristics.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Installer shall verify that coordination, and required sequencing of the Work have been provided, and that conditions comply with requirements, and are acceptable for installation of membrane roof system including insulation, flashing and related accessories. Provide written statement of unacceptable conditions to Contractor for correction.
   1. Comply with requirements of this Section and Section 07 62 00 for sheet metal flashing.

B. Do not proceed with installation until the Work has been properly coordinated, and noncompliant, and unacceptable conditions have been corrected. Start of work by installer will be interpreted as Installer acceptance of conditions.

3.2 PREPARATION

A. Substrate For Roof Membrane: Sound, uniform surface, sloped where indicated, free of projections, depressions, and contaminants that could impair optimum service of installed roof assembly. Comply with membrane manufacturer's recommendations for substrate preparation, including priming.
   1. Contractor shall review installation areas with Manufacturer's Field Quality Control Agent, installer and Design Builder and comply with Quality Control Agent's directives for corrections to installation areas.
   2. For roof installations installed directly on metal roof deck provide continuous underlayment mechanically attached to the metal deck at intervals to comply with specified performance requirements.
   3. Provide continuous layer of Protection Board over foam insulation throughout membrane roof assembly.

B. Complete installation of cant strips, components to receive mechanical anchors, flashings, and accessory items as shown, and as recommended by manufacturer even though not shown.
   1. Inspect blocking, keyways and all other anchorage components not installed as work of this Section and confirm they have been secured to the structure with corrosion resistant fasteners and to withstand the required wind loads and pressures.

3.3 INSTALLATION

A. An aesthetically pleasing overall appearance of the finished roof application is required. Adopt means and methods and work processes to ensure uniformity in appearance of the completed work. Dress seams and other areas and prevent telegraphing of fastener plates through membrane.

B. Roof Insulation: Coordinate with installation of roof membrane. Do not install more insulation each day than can be covered with membrane before end of day, and prior to inclement weather. Run long joints of insulation in continuous straight line, perpendicular to roof slope, off-set all joints in successive layers of insulation. Ensure that insulation installed in the Work is continuous throughout the area required and placed so as to achieve the optimum

resistance to heat flow through the insulated assembly. Provide average R-Value specified for roof area.

1. Provide a minimum of two layers of insulation exclusive of tapered units. Stagger end joints between rows and off-set joints between boards and layers as required. Seal joints between boards in the initial layer and provide air-tight flexible seals at penetrations and termination of insulation.
2. Trim insulation at roof drains so surface is flush with drain ring, cut and fit tightly at obstructions.
3. Tapered Insulation: Minimum two percent (0.25 inch per foot) slope normal to slope.
4. Secure to roof deck; mechanically attach, and adhere as necessary for system required, and comply with performance requirements.
5. Insulation Protection Board: Secure to insulation and roof deck per manufacturer’s recommendations and to comply with Performance Requirements and Roof Assembly Warranty specified for this Section.

C. Membrane: Commence installation in presence of manufacturer's technical representative; comply with requirements, and membrane manufacturer's recommendations. Provide flashings and counterflashings indicated, and as recommended by membrane manufacturer.
   1. Membrane Seaming System: Manufacturer's standard for lapped joints, and exposed spliced edges.
   2. Accessory Components: Provide factory fabricated components for corners, penetration boots and similar details; field fabricated components are not acceptable where the manufacturer offers a prefabricated component.
   3. Where recommended by manufacturer and otherwise necessary for the Work provide bonding adhesives, tapes, flashing cements, seals and all necessary preparatory materials to complete the installation required.

D. Fully Adhered Installation: provide a fully adhered, insulated membrane roofing assembly identical to that successfully tested by a qualified testing and inspecting agency to resist the factored design uplift pressures calculated per Project criteria stated and referenced herein. Apply adhesive to bond surfaces, roll membrane into place when adhesive has properly cured. Lap sheets, weld seams, and seal exposed sheet edges. Provide mechanical fasteners as recommended by the roof membrane manufacturer and per approved submittals.

E. Traffic Path: Flexible rolled, heat-welded wthermoplastic walkway at locations indicated, and as necessary for access to roof areas and roof mounted equipment, Sarnatred-V, walkway with chevron-textured surface pattern or approved equal.
   1. Install pads to resist movement due to wind and other dynamic forces. Accommodate expansion and contraction due to temperature differential. Weep pads to allow for escape of water. Traffic path free of wrinkles, abrupt surface changes and similar defects.

F. Remove scrap materials debris and supplies during the course of the work. Give particular attention to debris and materials (such as anchors and plates) that could damage the roof membrane. Maintain roof drains free of debris throughout the roof installation and verify their condition when the work is complete.

G. Limit construction traffic to those routes documented on approved Construction staging and installation drawing. Protect membrane components and installed assembly from damage due to construction traffic and activities until time of final acceptance.

3.4 FIELD QUALITY CONTROL

A. The Contractor shall be responsible for ensuring that the roofing materials manufacturer's Field Quality Control Agent is present at the Project for the following milestones as a minimum.
   1. Required Site Visits: Pre-Installation Conference, Rh tests and review of installation conditions, Rh testing, start of roofing work and at completion of roofing work. Manufacturer's agent shall also visit the site not less than 3 times while roofing work is actively in progress without prior notice to the Contractor and at such intervals that they have observed and inspected execution of typical terminations at low and high parapet walls and penetrations.
      a. Perform seam tests of areas selected by the Architect during each progress visit.
   2. At completion of the work contractor shall provide manufacturer's certification that the work of this Section complies with all of the manufacturer's warranty requirements and has been installed in accordance with manufacturer's accepted practices. Contractor shall notify the Architect of any exclusion and exceptions in this certification and provide corrective work to eliminate each exclusion and exception at no additional cost to the Project.

END OF SECTION

SECTION 07 62 00 –SHEET METAL FLASHING

PART 1 - GENERAL

1.1 SUMMARY

A. References: Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual; comply with recommended material weights and details except where Project requirements are more stringent.

B. Related Sections:
1. Section 04 22 00 Concrete Unit Masonry.
2. Section 07 54 19 Polyvinyl Chloride (PVC) Roofing.
3. Section 07 72 00 Roof Accessories.
4. Section 07 92 00 Joint Sealers.
5. Section 08 32 13 Glazed Sliding Stacking Doors.
6. Section 08 41 00 Aluminum Entrances and Storefront.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting:

B. Sequencing: Coordinate work of this Section with work of assemblies where flashing is required as necessary to achieve an integrated installation complying with performance requirements for the Work.

1.3 SUBMITTALS

A. Product Data: Required for each material, manufactured product, and accessory to be incorporated into the Work.

B. Samples:
1. Sheet Stock: Three pieces, one square foot of each material and gage to be incorporated into the Work.
2. Seamed Samples: Two pieces joined as required for flat seam roof and incorporating one cleat as required for anchorage to supports.
3. Formed Sample: Full size sample 10 inches in length of two-piece cornice coping in profile required for the final work.

C. Shop Drawings: Pan layout for all work, details of typical joints, seams, and anchorage. Provide large scale details for each profile required and showing sheathing, blocking, and support for completed assemblies as installed.

D. Mock-Up: As directed and as necessary to demonstrate each type of joinery, seam, and anchorage to be used in the Work.

1.4 WARRANTY

A. Sheet Metal Flashing: Written format acceptable to Owner, signed by Fabricator- Installer. Replace, and repair flashing, as acceptable to the Owner, that fails to remain weather tight, comply with Contract requirements, deteriorates in excess of manufacturer's representations, and is otherwise determined to be defective, for a period of 2 years after date of substantial completion.

B. Finish on Prefinished Coated Steel Sheet: 10 years warranty against fading, chalking, crazing, and other degradation in appearance and performance.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: The Contract Documents indicate the general configuration and appearance required for the completed work. Details of all conditions are not necessarily shown; final resolution of details where complete information is not shown shall be the responsibility of the Contractor such that the completed installation is durable and permanently weathertight. Where necessary to conform to Performance and Warranty requirements assembly details shall be revised without significant alteration to appearance as determined by the Architect. Such work shall be considered within the scope required by the Contract and shall not be used as a basis for Claims or other modification to the Contract. Work shall comply with recommended practices of NRCA Roofing and Waterproofing Manual and SMACNA Architectural Sheetmetal Manual; give particular attention to portions cited below.
   1. Gutters: SMACNA Architectural Sheetmetal Manual figure 1-21.
   2. Fascias, Accents and Accessory Components: Single and Double Flat Lock seams as indicated and as necessary to comply with Performance Requirements.
   3. Roof Edge Securement: Comply with California Building Code Chapter 1504.5.
   4. Cornice Coping: Provide continuous support by sheathing, blocking, shims and similar components regardless of whether shown on the drawings.
   5. Soffits at roof overhangs, eaves and similar conditions.

B. Performance Requirements: Provide metal fabrications, anchors and ancillary supports necessary to ensure the structural integrity of sheet metal work such that it remains free from damage, deformation and deflection exceeding allowable tolerances when subject to specified load criteria.
   1. Structural Performance: Accommodate the loads and stresses per criteria in the General Structural Notes with neither permanent deformation nor a reduction in weatherproof performance.
      a. Temperature Range: Accommodate thermal movement and stress for temperature differential of 20 degrees to 160 degrees.
   2. Limit movement and deflection within flashing assembly when subject to required load conditions and temperature range to 0.0057 of span. Prevent adverse impact to flashing appearance alteration due to movement and deflection of components.

2.2 MATERIALS

A. Prefinished Coated Sheet Steel: Licensed member manufacturer of the Galvalume® Sheet Producers of North America and conforming to ASTM Specification A792. 24 gage sheet

steel, with 55 percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; AZ55 (0.55 oz/sq. ft.) coating weight.

B. Steel Sheet: ASTM A 568 with zinc coating complying with ASTM A 653 designation G90, or aluminum-zinc alloy coated per ASTM A792 A55; 24 gage, lock-forming not oiled, phosphatized where necessary for painting, limited spangle.
   1. Coated Steel Pre-painted by Coil-coating Process: ASTM A 755

C. Steel Sheet: ASTM A 792, 22 gage AZ55 Zinc-aluminum coating

D. Stainless Steel: 24 gage; ASTM A 480, Type 304, annealed, No. 2D or 2B cold rolled bright finish, unless harder temper required for forming or performance.

E. Aluminum: Provide alloy and temper as indicated,and recommended by producer or fabricator for finish specified.
   1. Extrusions: ASTM B 221; performance characteristics: 6063-T5.
   2. Plate: ASTM B 209; performance characteristics: 5005-H15; thickness of 0.080 inch unless otherwise required.
   3. Sheet: ASTM B 209; performance characteristics: 5005-H15; thickness of 0.025 inch unless otherwise required

F. Copper: 20-ounce, ASTM B 370, H00 temper.
   1. Lead Coating: 0.06 lbs. per sq. ft. on exposed surfaces.

G. Flexible Flashing: For work not included in Section 07 25 13 provide ANSI/RMA IPR-1 non-reinforced black EPDM rubber sheet.

2.3 ACCESSORIES

A. Cleats: Fabricated of coated sheet steel; metal gage and configuration shall comply with SMACNA or NRCA standards for the assembly types required.

B. Fasteners, anchors, and accessories: Galvanically compatible with metal fastened; provide stainless steel for stainless steel flashing. Provide anchor size and type necessary for installation required.

C. Provide clips, anchors, and accessories in sizes necessary and as required for installation of Work; compatible with material installed.
   1. Provide snap-lock reglets and interlocking flashing components as required for terminations at membrane and metal roof assemblies.

D. Solder: ASTM B 32, tin-lead, 50 - 50 rosin flux, except 60 - 40 acid-chloride flux for non-tinned stainless steel.

E. Joint Sealers: Compatible with the rubberized asphalt underlayment; provide silicone-based polymers unless otherwise recommended by metal fabricator for the Work.

F. Elastomeric Transition Gasket: Pre-cured silicone extrusion per Section 08 44 00 requirements or similar approved fabrications.

2.4 FABRICATION

A. Shop-fabricate Work to greatest extent possible; form to lines, levels, profiles and substrates indicated. Comply with details shown, SMACNA Architectural Sheet Metal Manual, and material manufacturer's recommendations. Prevent oil-canning, buckling, and tool marks; fold exposed edges back to form hems.
   1. Differential Movement, Expansion, and Contraction: Accommodated to provide optimal performance; provide weatherproof and water-tight joints of design acceptable to Architect; provide for proper installation of elastomeric sealant.
   2. Non-moving Seams: Flat-lock, tin edges to be seamed, form, and solder.
   3. Isolate galvanically active metals, and corrosive substrates; prevent galvanic action. Coat concealed contact surfaces with bituminous coating or other acceptable separation.
   4. Lap transverse flashing joints 4 inches and bed in sealant, and hem ends and edges to form a pan.

B. Sheet Metal Flashing in Curtain Wall and Storefront: Fabricated from stainless steel.

C. Factory Applied Finish: Comply with AAMA 2605 performance criteria; utilizing 70 percent PVDF Fluoropolymer or aliphatic polyurethane polymers and qualifying for the specified Warranty. Provide uniform appearance in color, gloss, and thickness. Apply to stock prior to fabrication unless otherwise acceptable.
   1. Color and Gloss: Where not Scheduled or otherwise indicated in Drawings, provide in color and gloss as directed by Architect.

D. Gutters: Provide double wall Box type gutters in the configuration indicated. Provide single piece fabrication to the maximum extent and complying with SMACNA recommendations. Provide watertight joints and accommodate movement within required temperature range at intervals recommended by SMACNA.
   1. Coordinate gutter assembly and conductor head with rain chain in lieu of sheet metal down spout where indicated for leak-free performance.
   2. Conductor-Head Guards: 20-gage bronze or nonmagnetic stainless-steel mesh, with selvaged edges.
   3. Conductors: Plain, round 3 inches diameter.
   4. Hangers: Number 10 and 30 Gem Circle hangers by Superior Roof Drainage Products 800.523.8852.

E. Rain Chain: Provide in lengths required and in finish as directed by Architect; install taut, secured at gutter conductor and anchored below grade as shown; coordinate tie-in to storm drain system. Basis of design is products of Nutshell Stores, Cup or Link Style as indicated in Drawings, in [Brushed Type 304 Stainless Steel] [Mill Finish Aluminum].
   a. Lengths: As Field Verified by Contractor, to 16’-0” maximum.
   b. Accessories: Manufacturer’s standard installation kit; match base metal to rain chain; field paint to match gutter color using compatible prime coat.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Integrate flashing into each of the assemblies in which it is required so as to provide effective control of moisture entering or otherwise occurring in the assembly. Collect the moisture and conduct it to the exterior for drainage without adverse effect on the performance and durability

of the assembly. Ensure continuity among flashing within different assemblies and provide a fully integrated system for the exterior of the building.

1. Provide effective drainage and venting of concealed cavities.

B. Install work true to established lines and levels; anchor in place; permanently watertight and weatherproof. Use concealed fasteners and provide for thermal movement. Comply with SMACNA Architectural Sheet Metal Manual, and manufacturer's recommendations.

1. Provide cleats and other anchors for sheet metal at intervals recommended by referenced Standards and as necessary to comply with performance requirements; moving seams shall have sufficient overlap to prevent water intrusion, but not less than three inches.
2. Provide continuous support for sheetmetal fabrications of this Section; Coordinate with supporting structure. Ensure effective anchorage of cleats and other attachments.

C. Isolate galvanically active metals, and corrosive substrates. Use slip sheet, underlayment, and bituminous coating where indicated, and as necessary to provide effective separation.

1. Provide effective drainage of concealed cavities.
2. Provide Underlayment for metal flashing components in locations required.
3. isolation membrane for metal flashing components in locations required.

D. Flashing in Concrete Masonry Unit Assemblies: Coordinate with masonry work of Section 04 22 00 and related components including but not limited to through-wall penetrations and weather barrier. Provide contiguous effective collection, control and drainage of moisture entering or otherwise occurring in cladding assemblies. Collect the moisture and conduct it to the exterior for drainage without adverse effect on the performance, durability and appearance of the assembly. Ensure continuity among water control features within the storefront and adjacent assemblies and provide a fully integrated system for the building envelope. Provide stainless steel sheet metal flashing except where flexible flashing is indicated.

1. Exposed work shall have a neat uniform appearance. Terminated edges to form a drip and locate to minimize visual impact on work.

E. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

F. Protection: Provide to ensure that sheet metal work is free of marks such as hand and footprints, stains and other damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 07 81 00 – APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for cementitious, sprayed-on fireproofing.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Perform field bond test prior to or in conjunction with Conference. Include all testing agents, manufacturer's field representative, applicator and others as directed.

B. Apply fire-resistive material prior to concealing members with enclosing construction. Do not conceal work until inspection and required tests are complete and the work has been accepted. Sequence work to minimize the need for cutting and patching of fire-resistive material for installation of other work.
   1. Install clips, sleeves, hangars, and items that will penetrate fire-resistive material prior to application of fireproofing.
   2. Coordinate installation of ducts, piping, and other items that would interfere with applying fire-resistive material with application of fire protection.

C. Apply fire protection on composite metal deck following placement of concrete.

D. Sequence installation to allow for field testing as Work progresses. Do not proceed with fireproofing of next area until test results for previously completed work evidence compliance with requirements.

1.3 SUBMITTALS

A. Product Data and manufacturer's recommended application procedures.
   1. Fire-resistive material manufacturer's certification of product compatibility with project substrates including necessary surface preparation, primers and coatings based on independent testing and prior application experience.

B. Shop Drawings: Structural framing plans indicating the locations and types of surface preparations required before applying sprayed fire-resistive material. Extent and thickness of sprayed fire-resistive material for each construction and fire-resistance rating, including UL assembly designation.
   1. Identify finish treatment required for sprayed fire-resistive material after application.

C. Quality Control Submittals: Test reports, and certification of compliance with referenced standards and fire protection rating.
   1. Results of Contractor's field tests of product bond to Project substrates.

D. Demonstrate coordination with Contractor's Vapor Emission Control Plan. Ensure that work of this Section neither contributes to elevated moisture content in concrete and masonry substrates nor complicates subsequent application of finishes to these substrates.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: NFCA Member firm UL certified as a Qualified SFRM Contractor and approved by fire-resistive material manufacturer as an installer of the required products to achieve the fire-resistive performance required.

1.5 FIELD CONDITIONS

A. Environmental Requirements: Minimum ambient and substrate temperatures of 40 degrees F for 24 hours prior to and following application of fireproofing. Ventilate Work as recommended and as necessary to promote drying.

B. Existing Conditions: Where fireproofing has been removed in the course of hazardous materials abatement, selective demolition and other work the Contractor shall apply new fireproofing as required for work of this Section. Coordinate fireproofing work with Owner's abatement contractor. Scope of work for repair of abated areas shall be as necessary to maintain required fire resistance ratings of structure and decking.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Sprayed-On Fireproofing: Materials and installation conforming to assemblies listed in UL "Fire Resistance Directory" and tested in accordance with ASTM E 119. Products of a single manufacturer for each type of fireproofing required.
   1. Certified by manufacturer and independent laboratory to be asbestos free.

B. Portland Cement Fireproofing Medium Density:
   1. Concealed within the completed structure, having only incidental gypsum content for shrinkage control, products having a dominate gypsum content are not acceptable; GCP Applied Technologies Monokote Z106HY, Cafco 400 or approved.
   2. Exposed to view within the completed structure, Manufacturer's standard products for areas exposed to impact and abrasion as required: GCP Applied Technologies MonoKote Z106-HY, or approved.
      a. Bond Strength: Minimum 2000-lbf/sq. ft. (94.5-kPa) cohesive and adhesive strength based on field testing according to ASTM E 736.
      b. Density: Not less than 22 pcf density as tested in accordance with ASTM E 605.
      c. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch (9 mm).
      d. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
         1) a. Flame-Spread Index: 10 or less.
         2) b. Smoke-Developed Index: 10 or less.
      e. Compressive Strength: Minimum 100 lbf/sq. in. (680 kPa) according to ASTM E 761.
      f. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
      g. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
      h. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.

3. Sealer: Transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for each fire-resistance design; Cafco Bond-Seal or approved.
4. Fireproofing Repair: Subject to field verification of compatibility with existing material, provide GCP Applied Technologies Retro-Gard Type-RG or approved compatible substitute.

C. Auxiliary Fireproofing Materials: Compatible with sprayed-on fireproofing products and substrates and approved by fireproofing manufacturer for uses and fire-resistance rated designs indicated. Provide primer, adhesive, reinforcing fabric, sealer and other accessories as necessary and as recommended by fireproofing manufacturer for assemblies required.

2.2 MIXES

A. Cementitious Fireproofing: Factory-mixed dry formulation of inorganic binders and lightweight mineral aggregates mixed with water at project site to form a slurry for pumping and dispersal by compressed air introduced at spray nozzle.

B. Proportion mix as specified by fireproofing manufacturer for application method used, and as required for substrates, and specified fire resistance ratings.

C. Asbestos Content: Certified by manufacturer and independent laboratory as containing no detectable asbestos as determined per 40 CFR 763, Subpart E, Appendix E, Section 1, Polarized Light Microscopy.

D. Water: Potable and free of contaminants deleterious to fireproofing performance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Work has been properly sequenced; substrates are accessible, not concealed by ducts, piping, equipment and construction, and free of contaminants which could impair fireproofing performance.
1. Perform fireproofing bond tests as directed and as necessary to confirm that substrate is acceptable.

3.2 PREPARATION

A. Protection: Prevent damage to other Work due fireproofing including overspray and fall-out of fireproofing materials.

B. Substrate Preparation: Comply with manufacturer's recommendations, remove coatings, loose mill scale, and contaminants that could impair fireproofing performance.

C. Prime substrate as recommended by fireproofing manufacturer and as necessary to ensure required fire protection.

3.3 APPLICATION

A. Apply fireproofing as scheduled and as necessary for required fire resistance ratings. Comply with manufacturer's recommendations for application procedures and equipment.

B. Exposed Fireproofing: Uniform spray texture finish unless otherwise required.
1. Finish: Roll flat surfaces with a damp paint roller, and apply topcoat where required.

C. Cure installed material in accordance with manufacturer's recommendations.

3.4 FIELD QUALITY CONTROL

A. Compatibility and Adhesion Testing: Contractor shall test representative sample of installed work per ASTM E 736 and requirements in UL's "Fire Resistance Directory" for coating materials and demonstrate compliance with Contract requirements.

B. Replace fireproofing within areas where test results indicate fireproofing does not comply with requirements.

3.5 CLEANING AND PROTECTION

A. Remove over-spray and fall-out, clean exposed surfaces, and remove evidence of soiling.

B. Protect fireproofing as recommended by manufacturer and installer from damage during subsequent construction operations until substantial completion. Repair and replace damaged fireproofing.

END OF SECTION

SECTION 07 81 22 - THIN-FILM INTUMESCENT FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for thin-film, intumescent fireproof coating on structural steel shapes utilizing paint products of a single manufacturer at bronze marquise structural steel.

1.2 REFERENCE STANDARDS

A. ASTM D2240 – Standard Test Method for Rubber Property – Durometer Hardness.

B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

C. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.

D. SSPC-PA 2 – Procedure for Determining Conformance to Dry Coating Thickness Requirements

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Provide field samples for review immediately following or in conjunction with Conference. Include all testing agents, manufacturer’s field representative, applicator and others as directed.

B. Sequence installation to allow for field testing as Work progresses. Do not proceed with fireproofing of next area until test results for previously completed work evidence compliance with requirements.
   1. Do not conceal fireproofing with field applied top coating or other work until inspection and required tests are complete and Work is accepted.
   2. Install clips, sleeves, hangars and items that will penetrate fireproofing prior to fireproofing installation.
   3. Minimize the need for alterations to applied fireproofing for installation of other Work.

1.4 SUBMITTALS

A. Product Data and manufacturer's recommended application procedures.
   1. Certification that fireproofing components provided as work of this Section comply with limitations on VOC content and chemical compounds.

B. Samples: Prior To Ordering Paint: Two samples on 12 in. by 12 in. hardboard for Architect's review of color, sheen and texture. Submit new samples until acceptable appearance achieved.
   1. Confirm color of paint mixed for job matches previous samples, submit a second set of draw-downs, revise paint color as directed by Architect until satisfactory match achieved.

2. Field Samples: Apply complete system including all coatings required for the Work in thickness necessary for the required fire resistance rating. Provide field samples on components that will be concealed in the complete work in the locations directed.
   a. Demonstrate finish texture, transition between different systems and overall appearance to be acceptable in the completed Project.

C. Quality Control Submittals: Test reports, applicator qualifications and certification of compliance with referenced standards and fire protection rating.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: Certified by the manufacturer of the intumescent fireproofing to be applied as a qualified to apply the products and accessories necessary to comply with System Description and Project requirements.
   1. Applicator shall have 5 years successful experience with the materials being used and shall be a knowledgeable expert in all aspects of proper application and cure for the required systems.
   2. Provide documentation of three previous projects using the materials proposed for Project applications required.

1.6 FIELD CONDITIONS

A. Environmental Requirements: Provide controlled conditions for application of intumescent fire proofing; ambient temperatures of 50 to 70 degrees F and relative Humidity between 50 and 70 percent for 48 hours prior to and following application of fireproofing.
   1. Ventilation: By mechanical means, provide a minimum of 3 air changes per hour in enclosed areas.
   2. Provide temporary enclosure of work area or other acceptable means of controlling working conditions including contamination of paint surfaces with dust and other airborne particulates.
   3. Provide a record of temperature and humidity from a recording hygrothermograph demonstrating compliance with environment requirements.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Fireproofing: Provide intumescent thin-film fire protection systems tested by an independent testing agency in accordance with ASTM E199 for spray application in the field. Dry Film Thickness shall provide a UL listing of 2 hours for the steel columns and 1.5 hours for steel roof structure be protected. The specified product shall set the standard for DFT, products having a thicker DFT for the specified fire resistance are not acceptable.
   1. Final determination of products and work necessary for work of this Section shall be the contractor's. Provide all products and application methods and sequence necessary to comply with finish appearance requirements regardless of whether they specifically enumerated in the Contract Documents at no additional cost to the Owner.
   2. Finish on Concealed Work: As necessary to achieve required fire resistance rating for the work.
   3. Final determination of products necessary for work of this Section shall be the Contractor's responsibility. Provide all products, application methods and sequence

necessary to comply with performance requirements regardless of whether enumerated in the Contract Documents at no additional cost to the Owner.

B. Performance Requirements: Materials and installation conforming to assemblies listed in UL "Fire Resistance Directory" and tested in accordance with ASTM E 119.
   1. Provide 2-hour fire resistance rating on the marquise concealed steel columns, and 1.5-hour fire resistance rating on the marquise concealed horizontal steel structure as indicated and specified herein.

2.2 MANUFACTURED COMPONENTS

A. Thin-Film Intumescent Fireproofing: Products of a single manufacturer for each type of fireproofing required. Subject to compliance with specified requirements, provide the following manufacturers' products, or an approved substitution.
   1. Steel Having Only Interior Exposure: Products of Viking Corp., Tyco Fire Products or Reliable; provide a compatible primer recommended by the manufacturer.
      a. Surface Burning Characteristics: Class A, flame spread/smoked developed 25/450 maximum when tested in accordance with ASTM E84.
      b. Durometer Hardness, Type D: 60 minimum in accordance with ASTM D2240.
   2. Primer Coating and Protective Top Coating: Products manufactured and approved by the Fireproofing manufacturer for use together with thin film fireproofing as a complete system.
   3. Accessories: Products to be applied on site shall comply with VOC and chemical compound limitations for the Work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to determine if they are in satisfactory condition to receive intumescent fire protection; verify that substrates are clean and free of oil, grease, incompatible primers, or other foreign substances capable of impairing bond to fireproofing system.

B. Do not being installation until substrates have been properly prepared.

C. If substate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Thoroughly clean surfaces to receive fireproofing.

B. Repair substrates to remove surface imperfections that could affect uniformity of texture and thickness of fireproofing system, and remove minor projections and fill voids that could telegraph through finished work.

C. Cover or otherwise protect other work that might be damaged by fallout or overspray of fireproofing system, and provide temporary enclosures as necessary to confine operations and maintain required ambient field conditions.

3.3 APPLICATION

A. Comply with manufacturer's instructions for each particular intumescent fire protection system installation application as indicated.

B. Apply manufacturer's recommend primer to required coating thickness.

C. Apply fireproofing to full thickness over entire area of each substate to be protected.

D. Apply coats at manufacturer's recommended rate to achieve dry film thickness (DFT) as required for fire resistance ratings designated for each condition.

E. Apply intumescent fire protection by spraying to maximum extent possible, and as necessary complete coverage by roller application or other method acceptable to manufacturer.

F. Achieve uniform finished appearance.

3.4 FIELD QUALITY CONTROL

A. Tests: Comply with requirements for Special Inspections of OSSC Chapter 17 and the following.
   1. Applicator Testing: Provide written documentation of continuous wet film testing of the work during application to ensure the required DFT is achieved and to maintain compliance with manufacturer's recommended application procedures.
   2. Special Inspection: Owner's independent testing laboratory will inspect the work per ASTM D 3276 and determine the DFT and adhesion of the intumescent fireproofing as appropriate to the status of the work. Test areas will be selected by the laboratory in the frequency required by Regulatory Authorities to demonstrate compliance with Code requirements, but not less than one test for every 250 square feet of material covered.
      a. Dry Film Thickness: Determined in accordance with SSPC PA2.
      b. Adhesion: ASTM D 4541.

B. Repair fireproofing as necessary due to field tests. Correct work where test results indicate fireproofing does not comply with Contract requirements.

C. Tests:
   1. Contractor Testing: Provide written documentation of continuous wet film testing of the work during application to ensure the required DFT is achieved and to maintain compliance with manufacturer's recommended application procedures.
   2. Owner Testing: Owner's independent testing laboratory will inspect the work per ASTM D 3276 and determine the DFT and adhesion of the intumescent fireproofing as appropriate to the status of the work. Test areas will be selected by the laboratory in the frequency required by Regulatory Authorities to demonstrate compliance with Code requirements, but not less than one test for every 250 square feet of material covered.
      a. Dry Film Thickness: Determined in accordance with SSPC PA2.
      b. Adhesion: ASTM D 4541.

D. Repair fireproofing as necessary due to field tests. Correct work where test results indicate fireproofing does not comply with Contract requirements.

3.5 CLEANING

A. Immediately after installation of fireproofing in each area, remove overspray and fallout from other surfaces and clean soiled areas.

3.6 PROTECTION

A. Protect installed intumescent fire protection from damage due to subsequent construction activities so fireproofing is without damage or deterioration before Date of Substantial Completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 84 00 – FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for firestopping products to maintain continuity of fire rated construction throughout the Project, at joints, openings and penetrations indicated, and as required for compliance with Code, and requirements of building and fire authorities.
   1. Fire Rated Sealants: Work of this Section, comply with applicable requirements of Section 07 92 00.
   2. Applications for firestop systems may include but are not necessarily limited to the following:
      a. Joints between horizontal and vertical construction assemblies; Perimeter fire containment between floor slabs and curtain walls and between floor slabs and exterior wall assembly.
      b. Head-of-wall joint with movement capability.
      c. Through- and membrane-penetration of walls by conduits, cables, and by insulated and uninsulated pipes and ducts
      d. Through-penetrations of floor slabs by conduits, cables, and by insulated and uninsulated pipes
      e. Wall opening protective materials for metallic outlet boxes.
   3. Applications for smoke seals may include but are not necessarily limited to the following.
      a. Acoustic seals in horizontal and vertical construction assemblies.
      b. Wall opening protective materials at junction boxes and similar components.
      c. Smoke gasketing of door jambs and heads is work of Section 08 71 00 Finish Hardware.

1.2 DEFINITIONS

A. F Rating: Time period that a firestop assembly can withstand fire and hose stream test as determined by ASTM E 814.

B. T Rating: As required for F Rating and to limit temperature rise above the initial temperature to 325 degrees F on protected side as determined by ASTM E 814.

C. L Rating: Resistance of firestop assembly to air leakage as determined by UL 1479.

D. Through-penetrant: Duct, pipe, conduit, cable tray or other component that continues directly through both sides of a vertical or horizontal assembly.

E. Membrane-penetrant: Switch box, service outlet or other component that penetrate one side of an assembly without continuing through the total assembly.

F. Perimeter Fire Barrier System: Specific assembly used to close the void between a fire resistance rated floor and abutting wall assembly whether rated or not.

G. Opening: Shall include any void, lacunae, and aperture, whether formed by a frame or incomplete construction, of any kind without limitation and may occur in both new and existing construction and is not otherwise recognized as a door or window.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Provide as required for coordination among multiple Trades performing work requiring penetration of fire rated assemblies and similar conditions where work of this Section is required to maintain the continuity of a required fire resistance rating.
   1. Coordinate work sequence for installation of firestop products with work for each type of penetrant and each assembly required for the Work to ensure proper application of materials and compliance with the fire resistive performance required.

1.4 SUBMITTALS

A. Product Data: Required for each material, manufactured product, and accessory to be incorporated into the Work. Provide UL listing number for specific assembly used at each penetration.

B. Fire Stopping Matrix: Provided for each firestopping assembly to be incorporated into the Work. Identify UL assembly number and rating and every constituent component. Matrix shall cross reference the assembly to each application it is proposed to be used in and indicate penetrant type, size, and material.
   1. Clearly identify assemblies incorporating fire stop components not produced by the same manufacturer and note why it is necessary to introduce products of more than a single manufacturer.

C. Certificates: Certify firestopping installer qualifications compliance.
   1. Where modification of a particular tested and listed fire stop assembly is necessary due to Project specific conditions submit the manufacturer’s Engineering Judgment, developed in accordance with International Firestop Council Guidelines, and acceptable to the authority having jurisdiction.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Firestop Contractors’ International Association member or Factory Mutual Class 4991 approved installer.

B. Field Inspection Agency Qualifications: Compliance with ASTM E 699 criteria and International Accreditation Services Inspection Agency Accreditation Criteria AC 291 and comply with IBC Section 1703. Familiarity with the firestop materials and assembly types required for the Work. Have a minimum 3 years documented record of successful performance of field inspections of firestopping work as a primary service offered by this firm.
   1. Personnel Qualifications: Passed Factory Mutual FM 4991 or UL Firestop Exam.

C. Deliver materials in unopened containers bearing manufacturer's name and product description. Store under cover and protected from damage. Remove damaged material from job site.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Demonstrate firestopping products have a comprehensive library of specific UL Listed assemblies that will address conditions and assemblies likely to be encountered on the Project.
   1. Provide fire stop assemblies listed by UL or other acceptable third-party agent having the required fire resistance for the specific type and configuration of penetration incorporating materials and components proposed or the Work.
   2. Limit each assembly to the products of a single manufacturer as represented by the UL listing for the assembly.

B. Performance Requirements: Fire block assembly for penetrations and configuration indicated able to withstand standard fire and hose stream test (F Rating) and limit temperature rise (T Rating) of penetrant on protected side as required by regulatory authorities.
   1. Surface Burning Characteristics: ASTM E 84.
   2. Fire Resistance: ASTM E 119.
   3. Fire Test of Through-Penetration Fire Stop: ASTM E 814.
   4. Smoke Seals: Comply with ICC Sections 709 and 710 and Section 909 and leakage tested in accordance with UL 1479 for compliance with required limits.
   5. Fire-Resistive Joints: Provide joint systems with fire-resistance ratings indicated, as determined per UL 2079 or (ASTM E 1399 and E 1966), but not less than the fire-resistance rating of the construction in which the joint occurs.
   6. Perimeter Fire Resistance, Movement Cycling and integrity Tests: ASTM E 2307.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide products of Metacaulk, United States Gypsum, 3M Fire Protection Products, or Specified Technologies, Inc.

2.3 MATERIALS

A. Materials: Products of a single manufacturer for each type of firestop assembly required for the Work. Provide all components necessary for the complete assembly to comply with Project requirements regardless of whether a particular component or product is identified in the Contract Documents or not.

B. Firestopping: Asbestos-free, intumesce when exposed to temperatures of 250 degrees F as necessary for the required performance, and maintain an effective barrier against flame, smoke and gasses, under actual fire conditions in the assemblies indicated without requiring removal of pipe insulation.

C. Firestop Assembly Rating: Not less than the fire-resistance rating of the assembly in which it will be installed and possessing all additional performance attributes necessary for compliance with all applicable regulatory requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, voids and joints where firestop systems are to be installed and verify conditions are in compliance with product requirements for firestopping materials and assemblies required. Correct non-compliant conditions before proceeding with installation.

B. Examine surfaces where smoke seal material is to be applied and verify conditions are in compliance with product requirements for smoke seal materials and assemblies required. Correct non-compliant conditions before proceeding with installation.

C. Inspect existing construction and identify openings and penetrations of any type in assemblies required to have a fire resistance or smoke barrier rating and provide firestopping as necessary to fill and seal the opening or penetration and maintain or establish the integrity of each assembly.

3.2 PREPARATION

A. Clean surfaces to receive firestopping and smoke seal materials to remove materials and substances that may adversely affect installation and performance and establish optimum conditions for installation of fire stopping materials.

B. Provide masking and drop cloths to prevent materials from contaminating any adjacent surfaces. Remove masking materials promptly following application of product.

3.3 INSTALLATION

A. Fire Stopping for the Work: Required at each penetration through a fire rated assembly without regard for the trade that performed the work to install or create the penetration, location of the penetration and the materials involved. Firestopping shall also be provided at work that is recessed within or may otherwise affect the integrity of a fire rated assembly, and shall effectively restore or maintain the required fire resistive performance. Firestop each penetration to maintain the integrity of the fire rated assembly affected and to conform to the UL listing of the firestop.

B. Fire Stopping for mechanical and plumbing work shall include but is not necessarily limited to smoke proof and fire resistive seals at pipe, duct, conduit and other penetrations. Firestop devices, and equipment mounted in fire rated assemblies.

C. Fire Stopping for electrical work, including signal and data systems shall include but is not necessarily limited to smoke proof and fire resistive seals at cable tray, wiring, conduit and other penetrations. Firestop electrical devices, panelboards and light fixtures recessed in fire rated assemblies.

D. Install materials in accordance with manufacturer's instructions. Provide firestopping at each joint and penetration in fire-resistive construction assemblies forming floors, shaft enclosures, exit enclosures, occupancy separations and corridors. Seal all holes or voids to provide an effective barrier against flame, smoke and gasses.
   1. Provide smoke seals at wall and floor intersections and at membrane-penetrants not required to have firestopping. Smoke seal installation shall conform to ASTM C919 methodology for acoustic sealing to achieve an STC of 50 or better.

2. Firestopping Installed in Openings Larger Than Four Inches: Capable of withstanding design loads required for original assembly.

E. Examine firestopped areas to ensure proper installation prior to closing, and covering, and keep accessible until inspection by applicable authority where required.

3.4 IDENTIFICATION

A. Identify penetration firestopping with preprinted permanent labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage.
2. Date of installation, Contractor and Installer's name, address, and phone number.
3. Assembly listing number and manufacturer of firestop components.

3.5 FIELD QUALITY CONTROL

A. Identify on the Record Drawings the location and system used for firestopping and smoke sealing.

B. Obtain documentation of inspection, acceptance and approval of firestopping and smoke sealing by appropriate parties prior to covering.

C. Special Inspection reports shall identify unacceptable installations, which shall be corrected by the responsible contractor and reinspected.

D. Special Inspection reports to be filed with the authority having jurisdiction shall indicate verification of inspection and acceptance.

E. When work is sufficiently complete to allow pressurization testing, each smoke zone shall be pressurized to a positive pressure of 0.05 inches water gage relative to adjacent zones and the air quantity required shall be recorded. Where the calculated leakage rate in the smoke zone is less than or equal to that allowed by CCR Title 24, Part 2, Section 714.4, the work shall be deemed acceptable. In unacceptable works, leaks shall be identified by cold smoke testing or other appropriate means and shall be repaired until it complies with Section 714.4.

END OF SECTION

SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes joint sealants, fillers, compressible seals, and accessories necessary, and required for sealing joints, and reveals as indicated, and required, and not specified in work of other Sections.
   1. Smoke Barriers and Fire Rated Seals: Work of Section 07 84 00, coordinate with requirements of this Section.

B. Definitions for terms used in this Section: ASTM C 717.
   1. Compatible: Materials, and surfaces that are not detrimental to performance of sealed joint; non-staining to substrate and sealer as determined by ASTM D 2203.
   2. Modulus of Elasticity: ASTM D 412 Tensile strength in pounds per square inch at 100 percent elongation tested at 77 degrees F, and 50 percent relative humidity after 14 days cure.
   3. Hardness: ASTM D 2240 Shore A.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Coordinate work of this Section with all other aspects of exterior envelope construction including but not limited to proactive coordination of work sequence, provisions to prevent delay due to seasonal weather conditions that may impact work, and requirements to optimize joint geometry. Have results of the following available for review.
   1. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers.
   2. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

B. Sequence sealant installation to prevent conflict with other construction operations that could alter joint substrates and reduce performance characteristics of installed sealant.

1.3 SUBMITTALS

A. Product Data: Required for each material, manufactured product, and accessory incorporated into the Work; manufacturer's recommendations for sealant installation for materials and configuration indicated.
   1. Each sealant product data submittal shall identify each joint assembly the sealant will be used in with a reference to the specification Section where the constituent products or materials are specified.

B. Samples: Each type and color of joint sealer required, in 0.5-inch-wide joints formed between two six-inch strips of material matching the appearance of exposed surfaces adjacent to joint sealers in the work.

C. Test Reports: Certified, current product formulation, demonstrate compliance with requirements for proposed installation, movement capacity, and compatibility with substrate and adjacent components.

1.4 QUALITY ASSURANCE

A. Installer: Three years successful experience with sealers, and assembly types required for this project. Assign mechanics from these earlier applications to this project, one of whom shall serve as lead mechanic, and be on site at all times work is in progress.
1. Provide certification of installer's status in the Sealant Waterproofing and Restoration Institute's Contractor Validation program or documentation for five similar projects in-service for two to five years and representative of similar work scope to the required.

B. Manufacturer's Field Quality Control Agent: Possess expert knowledge of the products being installed including preparation, application and field-testing requirements. Shall have authority to certify compliance of the Work with Project Warranty provisions. Shall be responsible for knowing the specifics of this installation and available to perform the required field testing and inspections.

C. Pre-Installation Conference: Comply with requirements for Project meetings.
1. Pre-Installation Field Samples: Evaluated with Architect and technical representative of waterproofing manufacturer present, prior to final approval of product for use on Project. Evaluate cured performance, and installation quality. Locate samples as directed.

1.5 FIELD CONDITIONS

A. Environmental Requirements: For installation of joint sealers; ambient and substrate temperature above 40 degrees F, and within the limits recommended by joint sealer manufacturer; dry substrate free of contaminants that could impair sealer performance.

B. Due to the potential variety of combinations between construction materials, sealant types, and sealant formulations, the final selection of which may be made by the Contractor; responsibility for ensuring sealant compatibility with Project conditions, not limited to bond surfaces, shall be the Contractor's.

1.6 WARRANTY

A. Special Installer’s Warranty: Signed by installer, joint sealers are free from defects in materials and workmanship, will not deteriorate in excess of normal weathering and remain in compliance with Project requirements for a period of 3 years, and agreeing upon receipt of written notice from the Owner to promptly repair, and replace any portion of the Work that does not; to the Owner's complete satisfaction, and at no cost to the Owner, nor change in contract amount.

B. Special Manufacturer’s Warranty: Manufacturer to furnish elastomeric joint sealants to repair or replace general exterior weather seals and other sealants in exterior assemblies that do not comply with performance and other requirements specified in this Section for a period of 5 years.

C. Special Warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications,
3. Mechanical damage caused by individuals, tools or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: ASTM C 1193 and ASTM C 1472; joint configuration recommended by manufacturer for optimum sealant performance for required application.
   1. Sealant Joints to be Painted: Comply with manufacturer's recommendations, coordinate with Section 09 91 13, 09 91 23 and 09 96 00 and ensure compatibility of paint and sealant.
   2. Sealant Backing: Closed cell material at all sealants having weather exposure; open cell for seals without weather exposure where necessary for proper sealant cure.

B. Performance Requirements: Sealer joints that are a continuous barrier to intrusion by water, air, sound, and foreign matter able to accommodate extension and contraction at moving joints, as required such that the integrity of each sealer joint is maintained under all in-service conditions.
   1. Exposed Sealants: Resistant to deterioration due to weathering, and exposure to ultraviolet radiation; resistant to abrasion where traffic may occur.
   2. Joint seals in the exterior building envelope shall comply with performance requirements for envelope integrity and as required for work of this Section.
   3. Provide sealant products and accessories for successful application to Project substrates in the configurations required and the installation conditions encountered in the Work. Products shall be compatible with bonding substrates and adjacent materials and suitable for the service conditions encountered.

C. VOC Content: Sealants and sealant primers shall comply with CALGreen VOC limitations:
   1. Architectural sealants shall have VOC content of 250 g/L or less.
   2. Sealants and sealant primers for nonporous surfaces shall have a VOC content of 250 g/L or less.
   3. Sealants and sealant primers for porous surfaces shall a a VOC content of 775 g/L or less.
   4. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers.: The building concentration of formaldehyde shall not exceed half the indoor recommended exposure limit, or 33 mcg/cu,m, and that of acetaldehyde shall not exceed 9 mcg.cu.m.

2.2 MANUFACTURERS

A. Joint Sealers: Products complying with Project requirements; produced by a single manufacturer for each type required, and by one of the following approved manufacturers for the sealer types listed.
   1. Urethane: Bostik, Pecora, Tremco, and Sika.
   2. Silicone: Dow, Pecora, and Tremco.

3. Polysulfide: Bostik, Pecora, and Thiokol.

2.3 MATERIALS

A. Products, and Accessories: Compatible with one another, and with joint substrates under conditions of application, and service indicated, as demonstrated by field testing, and experience. Not all Sealant types described are used; See Drawings for additional direction.
   1. Sealer Color: Exposed; selected by Architect from manufacturer's complete range of standard colors, concealed; natural color having optimal performance characteristics for product.

B. Elastomeric Sealant: ASTM C 920, chemically curing, of base polymer indicated.
   1. Grade and Hardness: Recommended by manufacturer for optimal performance in application indicated; self-leveling for joints in traffic surfaces, otherwise nonsag.
      a. Self-Leveling: Hardness 55; modulus not greater than 150 psi.
      b. Non-sag: Hardness 20 to 30; modulus not greater than 75 psi.
   2. Modulus of Elasticity: Unless otherwise required, lowest available consistent with joint configuration, and conditions of service, including movement.
   3. Type: Single component products; Type S, multicomponent products; Type M.

C. Polyurethane: Multi-component; Class 25; Uses T, and NT, M, G, A and, as applicable to joint substrates indicated, O. Provide as sealant for exterior joints and joints exposed to UV radiation except as otherwise required.

D. Silicone Sealant: Non-Acid-Cure; Class 25; Uses NT, G, A and, as applicable to joint substrates indicated, O. Provide for glazing and as follows.
   1. One-Part with Fungicide: For interior joints with nonporous substrates, ceramic tile, showers, sinks and plumbing fixtures.
   2. Two-Part: For Use T, M, and, as applicable to joint substrates indicated, O.

E. Polysulfide: Multicomponent; Class 12-1/2; Uses NT, M, G, A and, as applicable to joint substrates indicated, O.
   1. Pourable: Uses T, M, G, A and, as applicable to joint substrates indicated, O.
   2. Water Immersion: Uses T, M, G, A, and, as applicable to joint substrates indicated, O; history of successful performance in sealing joints immersed intermittently or continuously in water.

F. Polysulfide: Single component; Class 12-1/2; Uses T, M, G, A and, as applicable to joint substrates indicated, O.

G. Solvent-release-curing Sealants: ASTM C 1311 Single component, Uses NT, M. G, A and, as applicable to joint substrates indicated, O.
   1. Butyl: 75 percent solids; Tremco Butyl Sealant.
   2. Small Joint Sealant: Synthetic rubber sealant formulated for sealing joints 3/16-inch width or smaller; Tremco Seam Sealer.

H. Acrylic-Emulsion Sealant: ASTM C 834, Single component; Class 12-1/2, mildew resistant, paintable, for exposed interior applications; Tremco Acrylic Latex Caulk.

I. Acoustical Sealant for Concealed Joints: Synthetic rubber sealant for interior concealed joints to reduce transmission of airborne sound; Tremco Acoustical Sealant.

J. Polyurea Joint Filler: 100 percent solids, rapid-setting, Shore A hardness of 90 and suitable for joints 0.125 inch to 0.25 inches in width; Metzger McGuire EdgePro 90.

K. Butyl-Polyisobutylene Sealant: AAMA 809.1, Solvent-release-curing, for concealed joints; PTI 404, Protective Treatments, Inc.

L. Butyl-Polyisobutylene Tape Sealant: AAMA 804.1; Solvent-free, 100 percent solids, and paintable; Tremco 440 Tape.

M. Joint Fillers for Concrete Flatwork: ASTM D 1752 Type 1 cross-linked cellular polyethylene demonstrating 98 percent recovery to original thickness when compressed to 50 percent of original thickness, less than 0.05 percent water absorption by volume. Provide thickness necessary for joint widths and applications required. Fosroc Hydrocell XL or approved equal.

N. Bituminous Joint Filler for Concrete Paving: ASTM D 1751: See Civil Drawings for additional direction.

2.4 ACCESSORIES

A. Sealant Backing: Comply with ASTM C 1330, Type B requirements, non-gassing, preformed, resilient, plastic foam joint-filler strips, SOF Rod® by NOMACO Inc. Shall control sealant depth, aid in establishing optimum joint configuration, and provide isolation from components that may adversely affect sealant performance.

B. Joint Filler: Comply with ASTM D 8139 requirements for closed-cell, non-gassing, preformed, non-asphaltic, resilient, plastic foam joint-filler strips, Nomaflex by NOMACO Inc. Shall control sealant depth, aid in establishing optimum joint configuration, and provide isolation from components that may adversely affect sealant performance. Suitable for hot and cold applied sealants and not require a bond break.

C. Bond-Breaker Tape: Polyethylene or other plastic recommended by sealant manufacturer for preventing bond between sealant, joint filler, and other materials; self-adhesive tape where necessary.

D. Elastomeric Tubing Joint-Fillers: ASTM D 1056; Neoprene, butyl or EPDM non-absorbent to water and gas, resilient down to -26 degrees F, with low compression set; size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

E. Primer: Recommended by joint sealer manufacturer for optimum sealant performance, and as determined from preconstruction tests.

F. Cleaners for Nonporous Surfaces: Compatible with joint materials and substrates, and acceptable to manufacturer of sealer, and accessories.

G. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

2.5 SOURCE QUALITY CONTROL

A. Elastomeric Sealant Tests: Aged performance under cyclic movement, for hardness, stain resistance, adhesion and cohesion low-temperature flexibility, modulus of elasticity at 100

percent strain, effects of heat aging, and accelerated weathering; Conducted within 24 months of date of submission to Architect.

1. Submit to manufacturer of joint sealer products substrate materials of actual joint surfaces to be sealed for laboratory testing of sealants for adhesion to primed and unprimed substrates and for compatibility with secondary seals.
2. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealers to joint substrates under environmental conditions that will exist during actual installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify conditions under which work is to be performed for compliance with requirements. Provide written report listing conditions that may be detrimental to performance of installed work. Proceed with work only when unsatisfactory conditions have been corrected.

1. Confirm required joint configuration, including backing, bond break and isolation from incompatible materials (where necessary) can be accommodated within the actual joint configurations encountered.
2. Preformed Seals: Field verify actual joint profile conforms to manufacturer’s requirements for the seal products specified and that work sequence has been coordinated for proper installation of preformed seals adhered to abutting bonding substrates.

3.2 PREPARATION

A. Surface Cleaning of Joints: Immediately before installation of joint sealer; remove contaminants that could impair sealer performance, including paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer. Use mechanical and chemical methods as recommended by sealer manufacturer, and as necessary to meet requirements.

B. Prime joint substrates where necessary, and where recommended by sealer manufacturer based on preconstruction tests, and prior experience; comply with sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

C. Protection: Prevent deterioration of adjacent materials due to sealer installation work, cover surfaces with tape or other approved means of protection recommended by sealer manufacturer. Remove protection immediately after tooling, do not disturb joint seal.

D. Coordinate with work of other Sections affecting joint substrate conditions, geometry and all other conditions of installation for work of this Section to ensure compliance with System Description requirements; without limitation give particular attention to the following conditions.

1. Joints In and Abutting: Precast concrete specialties and curtain wall assemblies.

3.3 INSTALLATION

A. Comply with sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Installation Standard: ASTM C 1193 as applicable to materials, sealant type and joint conditions required.

C. Sealant Backing: As indicated, and necessary to support sealers, and produce configurations which allow optimum sealant performance; continuous installation with no gaps, punctures nor deviation in profile; remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.
1. Bond Breaker: Install to prevent third-side adhesion of sealant at back of joint.
2. Sealant backings: Closed-cell, nonabsorbent at primary and secondary weather seals.
3. Compressible seals serving as sealant backings: Comply with requirements for joint fillers.

D. Sealants: Provide direct contact and full wetting of substrates, properly fill joint recesses, provide uniform, cross-section, and depth relative to width and optimum sealant movement capability.
1. Moving, Non-Traffic Elastomeric Sealant Joints: Depth 50 percent of joint width; not more than 0.5 inch, nor less than 0.25 inch deep.

E. Tooling of Non-sag Sealants: Approved by sealant manufacturer; form smooth, uniform bead of configuration indicated, prior to skinning cure, eliminate air pockets, ensure contact, and proper sealant adhesion. Remove excess sealant. Do not discolor sealants, nor adjacent surfaces.
1. Tooled Joint Configurations: Profile indicated and conforming to ASTM C 1193, Figure 8; where no profile is indicated provide concave profile.

F. Preformed Seals: Provide fully adhered installation to opposing surfaces at joint per manufacturer's requirements and to ensure water and airtight seal throughout the length of the joint. Mechanical restraint of preformed seal by friction and compression into joint profile is not acceptable. Bonded application shall accept movement throughout the total range of seal per manufacturer's specifications.

G. Preformed Hollow Neoprene Gaskets: Provide continuous lengths, minimize end joints, use adhesive splices at joints; Recess gasket as indicated, but not less than 0.125 inch.
1. Joint Recesses: Clean crisp arris, sides straight and parallel.

H. Joint Filler at Concrete Flatwork: Polyurea joint filler; fully adhered installation to opposing surfaces at joint per manufacturer's requirements and to ensure a durable water-tight seal throughout the length of the joint. Secure the joint filler in place per manufacturer’s recommended procedure to prevent displacement due to subsequent work and in-service conditions. Provide at perimeter of grade support concrete flatwork abutting exterior paving and similar locations as indicated.

I. Acoustic Seals: Conform to ASTM C 919 methodology for acoustic sealing to achieve an STC of 50 or better. For smoke seal applications comply with Section 07 84 00 Firestopping requirements.
1. Provide a 0.5-inch-wide annular gap and continuous seal between gypsum panels and penetrations, including but not limited to plumbing penetrations, ductwork and other mechanical penetrations, electrical conduit and boxes.
2. Provide paintable sealant for joints that will remain exposed to view in completed work.

J. Curing: Comply with manufacturer's recommendations to obtain high early adhesive and cohesive strength, surface durability, and optimum sealer performance.

3.4 PROTECTION AND CLEANING

A. Protect joint sealers during and after curing period so that they are without deterioration or damage at time of substantial completion, other than normal weathering. Cut out and replace damaged and deteriorated joint sealers to produce joint sealer installations with repaired areas indistinguishable from original work.

B. Remove excess sealant, and spills as work progresses; use methods and materials approved by manufacturers of joint sealers, and acceptable to Architect.

3.5 FIELD QUALITY CONTROL

A. Test Method ASTM C 1193 Appendix X1.1 Method A, Method B may be acceptable at conditions where performing Method A test is impractical.
1. Dissimilar Bond Surface: Cut joint to isolate each substrate and test independently.
2. Retest failed applications until test results prove sealants comply with requirements.

B. Visual Inspection: Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements.

C. Record results in Field Test and Inspection Log: Test and Inspection locations, sealant fill, configuration, and dimensions. Type of failure (cohesive or adhesive), whether results are indicative of specific defect in the work, pull-test extension in inches or other acceptable units and as a percentage of joint.

PART 4 - JOINT SEALANT SCHEDULE

4.1 COLOR SELECTIONS:

A. Architect will provide color selections and locations for each sealant type and for Contractor’s use. Not all locations will have the same color. Custom colors will be required.

B. General: Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements
1. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.

C. Specialty perimeters where required for appearance or weather tightness:
1. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.

D. Exterior Locations:
1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A.
4. Where walks abut structural slabs or stoops.
5. Where walks abut exterior wall of buildings.
6. Where exposed interior concrete slabs abut vertical surfaces.
7. Where sealant is shown on the Drawings for concrete slabs.
8. Membrane Roofing Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
9. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
10. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
11. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.
12. Restoration of Panel Joints in Façade Cladding: Preformed Foam Sealants in sizes required to fit existing panel joints.
13. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
14. All Other Exterior Joints:
    a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.
    b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
15. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
16. Expansion and control joints in masonry.
17. Masonry at dissimilar material or at dissimilar masonry.
18. Sills and thresholds.
19. At miscellaneous locations where sealant is shown on Drawings.

E. Interior Locations:
1. Expansion and Control Joints:
    a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
    b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 35, for Use NT.
    c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
    d. Expansion and control joints in masonry walls.
    e. Masonry at dissimilar material or at dissimilar masonry.
    f. Sills and thresholds.
2. Interior Concrete Slabs on Grade: Urethane, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A; single component.
3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834.
    a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

SECTION 08 11 00 – METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for steel doors and hollow metal frames for doors and other openings as scheduled and indicated.

B. Related Sections:
1. Section 08 71 00 Door Hardware.
2. Section 08 81 00 Glass and Glazing.

1.2 ADMINISTRATIVE PROCEDURES

A. Pre-Installation Meeting: Coordinate with work of section 08 71 00 for door hardware and other trades as necessary to effectively coordinate work of this Section.

1.3 SUBMITTALS

A. Product Data: Required for each product used in work of this Section.

B. Shop Drawings: Fabrication and installation of door and frame, details of types, construction, location and installation of reinforcement, anchors, finish hardware, and accessories; elevations of door types.
1. Schedules: Use reference numbers shown on contract documents, coordinate glazing frames and stops, and glazing requirements. Coordinate with work of Section 08 14 00, 08 71 00 and 08 81 00.
2. Indicate deviations from referenced Standards for hollow metal door and frame installation proposed for the Work and Project specific details not addressed by the Standards.

C. Samples: Two, 6 inches square of each metal, color, and finish system required for Project.

D. Certification:
1. Engineering Judgment: For assemblies deviating from tested and labeled assembly to certify performance equivalent to the tested assembly.

1.4 DELIVERY, STORAGE AND HANDLING

A. Protect doors and frames from damage during shipping and storage; ship and store in carton or crate, protect factory applied finishes, keep dry, and prevent corrosion. Inspect work for damage upon delivery, replace, or repair damaged material as acceptable to Architect.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Hollow metal door and frame assemblies, frames for glazed assemblies and other openings of the size and configuration required and incorporating components complying with Steel Door Institute or Hollow Metal Manufacturer's Association standards and performance requirements.

2.2 MANUFACTURERS

A. Manufacturer: Member of Steel Door Institute or National Association of Architectural Metal Manufacturers and have five years successful experience with products required for the Project: Steelcraft or approved.

2.3 MATERIALS

A. Hot-Rolled Steel Sheet and Strip: ASTM A 1011 Commercial Steel Type

B. Cold-Rolled Steel Sheet: ASTM A 1008 Commercial Steel Type B.

C. Galvannealed Steel Sheet: ASTM A 653, Commercial Steel Type B A40 coating.

D. Electrolytic Zinc-Coated Steel Sheet: ASTM A 879 Commercial Steel Class B, mill phosphatized.

E. Stainless Steel: AISI Type 302/304, unless otherwise indicated.
1. Plate and Sheet: ASTM A 480, Type 304, annealed, No. 2D, unless harder temper required for forming or performance.
2. Fasteners: IFI-104 and ASTM F 738 and F 836.

F. Aluminum: Sheet, ASTM B 209, Alloy 3003; Extrusions, ASTM B 221, Alloy 6063-T52; minimum performance characteristics of alloy and temper listed, provide actual temper and alloy required for fabrication, and finishing.

G. Hardware, and Fasteners: Manufacturer's standard units.
1. Items Built into Exterior Walls: ASTM A 153, Class C and D.
2. Supports and Anchors: 18 gage galvanized sheet steel.
3. Exposed Fasteners: Countersunk, flat, Phillips head unless otherwise indicated.

H. Galvanic Isolation: Corrosion resistant, rapid-cure, two-component amido amine epoxy mastic that is self-priming on steel substrate; provide two coats for total dry film thickness not less than 6 mils; Benjamin Moore Low Cure Epoxy Mastic Coating M45L/M46; or other approved means of galvanic isolation of concealed contact and wash-down surfaces.
1. Prior to application on fire rated assemblies, confirm use will void neither UL Label nor listing.

2.4 FABRICATION

A. Doors and Frames: Types, and sizes required; rigid, neat in appearance, free from defects, warp, and buckle; fit and assemble units in manufacturer's plant to fullest extent possible,

identify work that cannot be permanently factory assembled before shipment, for proper assembly at Project. Comply with SDI-100 and the following.

1. Interior Steel Doors: Level 4, Model 2, 14 gage end closures with vertical steel stiffeners.
2. Exterior Steel Doors: Level 4, Model 2 Physical Performance Level A.
3. Stile and Rail Doors: Level 3, Model 3.
4. Exposed Door Panels, Stiles and Rails: Cold-rolled steel; other components may be cold or hot-rolled at manufacturer's option.
5. Close door top and bottom with intermittently welded channels; grind and dress welds smooth and continuously fill joint and finish flush for seamless appearance.
6. Provide square door edge unless otherwise indicated.

B. Insulated Assemblies: ASTM C 1363, and SDI 113; exterior openings, and other locations as Scheduled; total assembly door and frame not to exceed U-value of 0.37.

C. Complete preparation of doors and frames in shop for mortised and concealed hardware, reinforce as necessary for each type of hardware required; comply with ANSI A250.6, door and hardware schedules, templates, approved shop drawings, and DHI Recommended Locations for Builder's Hardware.

D. Drilling and tapping for surface-applied finish hardware may be done at Project.

E. Glaze doors and frames in shop or field, comply with requirements of Section 08 81 00; provide glass types as scheduled and required by Code.

1. Glazing Stops and Beads: 18 Gage steel, 45-degree beveled top; projected fascia returned to door face unless otherwise indicated; miter corners.
   a. Stops: Welded to door on security side.
   b. Beads: Secure with exposed fasteners, snap-on not acceptable.

2.5 SHOP FINISHES

A. Galvanize doors, and frames to be installed to be installed in masonry or concrete openings and all exterior assemblies. Provide ASTM A 924 hot-dipped, G90 galvanized coated or ASTM A 653 A60 galvannealed zinc-iron alloy coating for material type and size required.

B. Paint System: Uniform gloss, texture, and thickness; clean, treat, and prime doors and frames, including door bottoms and tops, and frame surfaces. Coordinate with Section 09 96 00 requirements to ensure compatibility among shop and field finish coatings.

1. Epoxy Coating: Self-priming, rapid-cure, two-component amido amine epoxy; Benjamin Moore Low Cure Epoxy Mastic Coating M45L/M46.
2. Shop Painting: Uniform gloss, texture, and thickness of 2.5 mils.; clean, treat, prime, and finish doors and frames, including door bottoms and tops, and surfaces exposed to view when door is open. Shop prime doors and frames unless otherwise required.

2.6 SOURCE QUALITY CONTROL

A. Fire-Rated Door and Frame Assemblies: Tested and labeled by acceptable laboratory for compliance with the hourly rating required, and positive pressure and temperature rise limits where required.

1. Fire-rated Assemblies: Configuration required including hardware, and glazing (if any), tested for compliance with UL 10B and 10C (GSZN), ASTM E 2074 and NFPA 252.

a. Temperature Rise Rating: 450 degrees F maximum in 30 minutes of fire exposure for doors into exit enclosures, and other locations where required by Code.
b. Smoke-Control Door Assemblies: NFPA 105, UL 10C and UL 1784.

2. Frames for Glazed Openings: Tested per NFPA 257 and UL 9. Glazing performance and labeling shall comply with Section 08 81 00 requirements.
3. Engineering Judgment: Provided by UL authorized source for required assemblies not identical to a tested assembly due to size, configuration or other factor as acceptable to regulatory authorities certifying performance equivalent to that of the tested assembly.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate and sequence the Work for proper installation of anchorages for standard steel frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete embeds, anchor bolts, and items with integral anchors.

3.2 INSTALLATION

A. Doors, Frames, and Accessories: Except for deviations documented by approved submittals install work to comply with the following standards and the manufacturer's recommendations for specific Project applications.
1. ANSI/DHI A115.IG, Installation Guide for Doors and Hardware.
2. ANSI A250.11, Recommended Erection Instructions for Steel Frames
3. SDI I22 Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
4. HMMA 840, Installation and Storage of Hollow Metal Doors and Frames.
5. NFPA 80.

B. Frames: Place prior to construction of adjoining walls, except at concrete, and masonry construction; set accurately in position, plumbed, aligned, and brace until permanent anchors are set. Provide three jamb anchors per jamb locate at hinge and strike levels, floor anchors may be powder-actuated, masonry anchors, or machine screws as indicated and as appropriate for the given assembly.
1. Fire-rated: NFPA Standard No. 80.
2. Secure to concrete and masonry with machine screws, and masonry anchors, unless otherwise required.
3. Secure to closed steel studs; attach studs to wall anchors with tapping screws.
4. Exposed fasteners shall be countersunk, filled and finish flush to the frame face.

C. Door Installation: Fit accurately in frames, within clearances specified in SDI-100, and NFPA Standard No. 80 except as otherwise necessary for required acoustic performance.

D. Finish Hardware: Comply with requirements of Section 08 71 00 and referenced Standards.

E. Field Priming and Finishing: Where galvannealed steel is provided field priming may be acceptable in lieu of shop priming. Field applied prime and finish paint shall comply with Section 09 90 00 requirements.

3.3 ADJUST AND CLEAN

A. Repair of Shop Applied Coating: Immediately after erection, sand smooth damaged, and deteriorated coatings and repair to restore original performance without evidence of repair work in the finished components, coatings that cannot be acceptably repaired in the field shall be returned to the shop, repaired and reinstalled.

B. Repair and Replacement of Damaged Doors and Frames: Where the Architect determines that a door or frame has been too severely damaged to represent new goods and materials as required by the Contract it shall be replaced by new undamaged work; regardless of whether this damage adversely effects door operation. Remedial work such as filling of dents and grinding to correct excessive damage is not acceptable in lieu of replacement.

C. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION

SECTION 08 14 00 – WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for flush panel and stile and rail wood doors. Standing and running trim are work of Section 06 40 00.

B. Related Sections:
1. Section 06 40 00 Architectural Woodwork.
2. Section 08 11 00 Metal Doors and Frames.
3. Section 08 71 00 Finish Hardware.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Coordinate with work of Section 08 11 00 for metal frames, Section 08 71 00 for finish hardware, Section 06 40 00 for woodwork and other trades as necessary for execution of the work required of this Section.

1.3 SUBMITTALS

A. Product Data: Required for each product to be incorporated into the Work, including details of core and edge construction, trim for openings and louvers, and factory finish specifications.
1. FSC Certified Wood: For each firm supplying wood products and each firm performing fabrication work on these wood products provide firm's COC number, identify each FSC certified product on a line-item basis and identify the material cost and value-added fabrication cost.
   a. Vendor Chain-of-Custody
   b. Fabricator Chain-of-Custody
   c. Installer Chain-of-Custody provide when the installer is other than the fabricator.

B. Shop Drawings: Fabrication and installation of doors, details of types, construction and veneer matching; location and installation of reinforcement, anchors, finish hardware, and accessories; elevations of door types.
1. Schedule: Use reference numbers shown on contract documents, coordinate glazing frames and stops, and glazing requirements.

C. Samples: Provide for each exposed species, cut, and finish, in sufficient number to demonstrate complete range of color and grain variation expected in Work but not less than three.
1. Solid Stock Samples: 1 foot length of member configured as required for the work including molding profiles.
2. Veneer and Panel Samples: Sufficient size to demonstrate required veneer sequence and typical flitch dimension but not less than 1 square foot.
3. Glazing Stops and Similar appurtenances: Two of each in the configuration proposed to be used in the work.

1.4 QUALITY ASSURANCE

A. Certification:
1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.
2. Provide WIC-Certified Compliance Certificate indicating that doors comply with requirements of grades specified.
3. Fire-Rated Wood Doors: UL Tested, Listed and Labeled; or other acceptable independent agent.
4. Sustainably Produced Wood Products: Chain of Custody certification that wood products originate from Certified Well-Managed Forests as determined by standards endorsed by the Forest Stewardship Council (FSC).
a. Acceptable FSC Certified Programs: Green Cross certification Program administered by Scientific Certification Systems (SCS); SmartWood Certification Program administered by Rainforest Alliance; and Silva Forest Foundation.
b. For information and sources for certified forest products, contact the Certified Forest Products Council at (503) 590-6600 or www.certifiedwood.org .

B. Environmental Requirements: Comply with Section 06 40 00 requirements for prevailing conditions for installation of woodwork.

C. Field Measurements: Hardware mortises in metal frames to verify dimensions and alignment prior to pre-machining door. Field verified dimensions for fit to hollow metal frames provided as work of Section 08 11 00.

1.5 WARRANTY

A. Warranty: Written agreement signed by Manufacturer, Installer and Contractor, providing for repair and replacement, to the Owner's satisfaction, of defective work, and work that does not conform to Project requirements; Warranty shall cover all work included in the original Contract; finishing, hardware preparation, and installation at no additional cost to Owner.
1. Warranty Period: From date of final acceptance.
a. Solid Core Flush Interior Doors: Life of installation.
b. Stile and Rail Doors: Five years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements:
1. Flush Doors: WDMA Industry Standard IS-1-A Architectural Wood Flush Doors, AWS Section 9.
2. Stile and Rail Doors: WDMA Industry Standard I.S.6-A Architectural Stile and Rail Doors, AWS Section 9.
3. Metal Frames: Comply with Section 08 11 00 requirements for assemblies required.

B. Performance Requirements: Fire-rated door and frame assemblies UL listed and labeled for compliance with NFPA 80 in size and configuration required with specified hardware, and glazing.

1. Door and Frame Assemblies: Tested per NFPA 252, or UL10B & 10C as necessary for required assembly performance. Coordinate with Section 08 11 00 for wood doors and hollow metal frame assemblies.
   a. Temperature Rise Rating: 450 degrees F maximum in 30 minutes of fire exposure for doors into exit enclosures, and other locations where required by Code.
   b. Smoke-Control Door Assemblies: NFPA 105, UL 10C and 1784.
2. Frames for Glazed Openings: Tested per NFPA 257 or UL 9. Glazing performance and labeling shall comply with Section 08 81 00 requirements.
3. Engineering Judgment: Provided by UL authorized source for required assemblies not identical to a tested assembly due to size, configuration or other factor as acceptable to regulatory authorities certifying performance equivalent to that of the tested assembly.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide wood doors from one of the following manufacturers unless otherwise indicated.
   1. Masonite, VT Industries, or approved.

B. Producer of Certified Sustainably Produced stave lumber cores: Algoma Hardwoods.

2.3 MATERIALS

A. Solid Stock: Certified Sustainably produced. Exposed members shall match grade, cut and species of exposed face veneer; concealed as required by reference standards.

B. Select veneer and lumber for uniform appearance of grain and color and arrange for optimum match between adjacent pieces and throughout the work as a whole. Coordinate with appearance of wood fabrications provided as work of Section 06 40 00 to provide a close visual match with work of this Section.

C. Faces and Edges of Wood Doors Scheduled to have opaque painted finish shall be an approved paint-grade species complying with referenced Standard.

D. Adhesive: Shall contain no added urea-formaldehyde resins, comply with ASTM D 5572 for finger joints and ASTM D 5751 for laminate joints; waterproof for doors in wet use locations and exterior.

E. Provide [Structural Composite Lumber] [Solid particle board] core containing no added urea-formaldehyde, with bonded stiles and rails comply with WDMA Extra Heavy Duty performance level as demonstrated by independently certified test data.
   1. When necessary for compliance with fire-resistance performance criteria a mineral core, reinforced for mounting of required hardware components shall be provided in lieu of other core material.

2.4 MANUFACTURED UNITS

A. Flush Panel Architectural Doors: Comply with AWS Section 9 requirements for Premium Grade work. Provide specified solid core construction.

1. Cross Banding: Provide 0,125-inch-thick engineered hardwood composite board, OSB and particle board are not acceptable. Wood veneer shall be a minimum of 0.125 thick and not telegraph through finish veneers.
2. Provide solid stock edges matching face veneers.

B. Openings: Cut and trim as indicated and required, use solid wood except where metal trim is required for fire rating; veneer wrap metal trim unless otherwise acceptable.

C. Fire Doors: Fire core as necessary for assembly configuration and performance required.
1. Stile Edge Screw Withdrawal: ASTM D 1037, 750 pounds.
2. Stile Edge Split Resistance: ASTM D 143, 1200 pounds.
3. Through-Bolt Pull-out: 1200 pounds.
4. Pairs: Formed steel edges and astragals, veneer wrapped on B and C label doors, except as otherwise required.
5. Intumescent Seals for Positive Pressure Doors: Concealed with veneer matching exposed door face.

D. Door Frames: AWS Premium Grade and as otherwise required for the Work; provide ploughed-in stop and dadoed joinery between head and jambs of frame. Factory fit wood doors and frames to required opening size, and to comply with installation tolerances, clearances and bevels. Preassemble finished frames for final installation in the field.

E. Glaze doors in field or shop; comply with requirements of Section 08 81 00; provide glass types as scheduled and required by Code.
1. Glazing: Comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials, and permanently labeled as Safety Glazing. Provide assembly type and configuration indicated and other characteristics such as color, fire rating and custom features as required.
   Glazing Stops and Beads: Shape and profile indicated, where not indicated provide 45 degree beveled top and projected fascia returned to door face, miter corners; solid wood except veneer wrapped 18 gage steel where necessary for assembly rating.
   a. Stops: Anchor on security side with concealed fasteners.
   b. Beads: Secured by exposed fasteners, snap-on not acceptable.
2. Shop finish stops and beads as required for doors.

F. Prefit and pre-machine doors for hardware to comply with Contract requirements and referenced woodworking standard. Comply with final hardware schedules, shop drawings, and hardware templates, see Section 08 71 00 for hardware requirements.

G. Factory fit wood doors and frames to required opening size, and to comply with installation tolerances, clearances, and bevels.

H. Coordinate wood doors with hollow metal frames of Section 08 11 00; fit to required opening size, and comply with installation tolerances, clearances, and bevels.
1. Fire Rated Assemblies: Comply with NFPA 80.
2. Lock and hinge Bevel: 0.125 inch in t2 inches unless otherwise required for fire resistant performance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify frame type, size, location, and swing complies with requirements and that door can be installed within required tolerances without field modification. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Condition doors to average prevailing humidity in installation area for at least twenty-four hours prior to hanging.

B. Hardware: Comply with requirements of Section 08 71 00.

C. Install doors to comply with manufacturer's instructions referenced WDMA standards and as otherwise required for the Work. Comply with Section 08 11 00 requirements for wood doors installed in hollow metal frames.

D. Where field fitting of doors is necessary and acceptable to Architect, machine and fit with uniform clearances and bevels required; do not trim stiles and rails in excess of NFPA standards and manufacturer's limits. Finish cut edges as required for shop work.

E. Tolerances: NFPA Standards 80 and 105 for assembly performance required.
1. 0.125 inch at jambs and heads.
2. 0.0625 inch per leaf at meeting stiles for pairs of doors.
3. 0.25 inch over finish floor covering, and as indicated.
4. 0.1875 inch at thresholds and saddles.
5. Bevel: 0.125 inch in 2 inches at lock and hinge edges.
6. Warp, bow, cup, or twist not exceeding 0.25 inch in a 42 by 84-inch section.
7. No telegraphing of core construction in face veneers.

F. Where the Architect determines that a door or frame has been too severely damaged to represent new goods and materials as required by the Contract it shall be replaced by new undamaged work; regardless of whether this damage adversely effects door function. Remedial work such as filling and sanding to correct excessive damage is not acceptable in lieu of replacement.
1. Restore damaged finishes, site cut, and machined surfaces and edges before installation, return to shop doors that cannot be acceptably refinished on site, replace work that cannot be acceptably repaired.

G. Operation: Replace and rehang doors that do not swing or operate freely, when directed by Architect.

H. Protect installed work as recommended by manufacturer and as required to assure that doors are without damage, nor deterioration at time of substantial completion.

END OF SECTION

SECTION 08 31 00 – ACCESS DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes products, equipment, labor and services to provide access doors as necessary and required.

1.2 SUBMITTALS

A. Product Data: Required for each material, manufactured product, and accessory to be incorporated into the Work.
   1. Provide complete information on removable core lock and keying.

B. Shop Drawings: Fabrication and installation of custom units; modifications to standard units, project specific installations. Indicate locking units.
   1. Coordination with Ceramic Tile: Indicate locations of access panels occurring in areas to receive ceramic tile and integrate panels with tile pattern.

C. Samples:
   1. Metal Finish: Two 3 x 5-inch pieces of panel face material and finished as required.
   2. Provide one complete access panel as a demonstration of appearance and assembly quality proposed for the Work; include cam lock as required.

D. Coordination Drawings: Penetrations, ceiling-mounted components, concealed framing, suspension systems, mechanical, plumbing and electrical systems, and other construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide access doors by one of the following: J.L. Industries, Karp Associates, Inc., Milcor (DuraVent), Nystrom, Inc. or Acudor Inc.

2.2 MANUFACTURED COMPONENTS

A. Access Door Assembly: Complete, and ready for installation; continuous welded steel construction unless otherwise indicated. Grind exposed welds smooth and flush with adjacent surfaces. Provide anchors and attachments necessary for installation indicated.
   1. Frames: 16 gage steel; provide flange type necessary for the installation required.
   2. Stainless Steel Frames and Flush Panel Doors: 14 gage stainless steel, No. 4. satin finish; concealed spring hinges or concealed piano hinge set to open 175 degrees.
   3. Flush Doors: 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees.
   4. Lock: Southco CM-6, removable core cam lock and PK core compatible with Schlage 1347 keyway.

5. Ceiling Doors: Recessed door panel depth necessary to finish ceiling insert and install flush to adjacent finish ceiling. Reinforced 18 gage sheet steel face. Provide access sleeves for locking devices.
   a. Size: As necessary for efficient access, but not less than 24 by 24 inches. Obtain Architect's acceptance of manufacturer's standard size units which vary from sizes indicated.
6. Plumbing Valve Doors: Recessed access door for tiled wall. Provide concealed pivoting bar hinge and frameless appearance.

B. Fire-Rated Units: Comply with NFPA 80, provide UL listed and labeled units having performance level required with insulated flush panel door, continuous piano hinge and self-closing mechanism for rated assemblies in sizes and configuration required.
1. Vertical Doors: NFPA 252 or UL 10B.
2. Horizontal Doors: ASTM E 119 or UL 263.

C. Securing of Units: Provide the specified lock for all panels where any portion is installed at a height 8 feet or less above finish floor; key locks and provide master keying as directed by Owner’s Representative. Secure units located more than 8 feet AFF with flush, screwdriver-operated cam locks, number required to hold door flush when closed.

D. Shop Applied Coating: Corrosion resistant prime paint compatible with field applied finish specified in Section 09 91 23.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Total number of doors required for access to mechanical equipment is not necessarily shown on drawings. Consult with Architect for direction on placement of required doors not shown on drawings.
1. Comply with Section 22 05 00 requirements for access doors for plumbing work and provide as work of this Section.
2. Comply with Section 23 05 00 requirements for access doors for HVAC work and provide as work of this Section.
3. Comply with Section 26 05 00 requirements for access doors for electrical work and provide as work of this Section.
4. Coordinate access door placement with ceramic wall tile layout, consistent with approved Shop Drawings to minimize cut tile and center vertically and horizontally within tile module.

B. Comply with manufacturer's instructions for installation of access doors. Provide all necessary support and supplemental framing for assembly where the access doors is required. Set accurately in position, plumb, level, and flush to adjacent finish surfaces; and secure to support.
1. Provide 60-minute, fire rated doors for units required in fire rated assemblies.
2. Provide stainless steel units in restrooms, wet areas and sterile areas.

C. Adjust hardware and panels for proper operation. Remove and replace damaged work and work that does not operate freely.

END OF SECTION

SECTION 08 32 13 – GLAZED SLIDING STACKING DOORS (METAL)

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for bi-parting and multi-leaf sliding and stacking aluminum framed glazed doors in the configurations required.

B. Related Sections:
1. Section 08 41 00 Aluminum Entrances and Storefront.
2. Section 08 71 00 Door Hardware.
3. Section 08 81 00 Glass and Glazing.

1.2 PROCEDURAL REQUIREMENTS

A. Preinstallation Conference: Comply with Project Meeting requirements. Review methods and procedures related to installation of curtain-wall assemblies specified as work of this Section and coordination with other components and assemblies of the building cladding,
1. Review and confirm Contractor's Project Schedule and work sequence and required tests and inspections.
2. Coordination of fabrications for head-track supports work of Section 05 50 00 and work of this Section for track and frame assemblies and hanging rod connections.

1.3 SUBMITTALS

A. Product Data: Submit as required for each material, manufactured product, accessory, and finish to be incorporated into the Work.

B. Shop Drawings: Prepared by the original component manufacturer; preparation by the site fabricator or installer is not acceptable. Elevations at 0.25-inch equals one foot scale, details at 3-inch equals one foot scale, full size sections of composite members and isometric drawings of joinery intersections and internal sealant applications. Provide details of all conditions for every member, reinforcing, support system, anchorage details, glazing and interface with adjacent work. Indicate all component locations and intersection details; method of isolating dissimilar materials; provisions for expansion and contraction. Indicate shop-assembled units and pick-points for field erection.
1. The Contractor shall provide professional engineering services for work of this Section to comply with System Description requirements. Engineer shall stamp and sign drawings and calculations prepared for this Project.
   a. Engineer Certification: Maximum deflections are within required limits, and probable glass breakage will not exceed frequency specified in Section 08 81 00 using manufacturers' data.
2. Show locations and details for sliding door support structures and connections to building structure and loads imposed on building structure; coordinate with work of Section 05 50 00 and tolerances for supporting structure and sliding glass doors. Document fastener type proposed for each application and note why proposed fastener is superior.
3. Indicate extent of work that is shop fabricated and assembled and work that is fabricated and assembled in the field.

4. Detail fabrication, attachments and installation for sills, track and custom fabrications if required.
5. Installation Details: Perimeter closure across transition between fenestration frame and rough opening with elastomeric closure in configuration and attachment for each assembly and system required.

C. Samples: Demonstrate fabrication, workmanship, and design of curtain wall. Provide a minimum of four samples of each type as required. Include an example of intersecting components either corner sections or intermediate mullion demonstrating representative appearance of component joinery to be provided in the Work.
1. Custom Fabrications: Provide samples of sills and closures in profiles and configurations required.
2. Finish: Apply to 12-inch sections of curtain wall members; use same extrusion and alloy to be used in final Work. Demonstrate acceptable appearance match specified for the Work.

D. Maintenance Manual: Document recommended frequency and cycle for inspections, and maintenance work for conditions of service representative of this facility such that in-service performance will comply with Project requirements. Identify means, methods and materials for inspection and assessment of operating components, cleaning and periodic maintenance necessary for reliable function and optimal service life. Provide complete listing of consumables and components reasonably anticipated to require replacement incidental to normal maintenance, and procedures for reglazing.

E. Quality Assurance Submittals: Demonstrate compliance with requirements.
1. Certificate of Production: For finish system and application.
2. Test Results: For curtain wall assembly as specified.

1.4 PROJECT CONDITIONS

A. Verification of Dimensions: Actual dimensions of in-place construction work for location, tolerance compliance, operating clearances and all other criteria that may impact work of this Section in advance of component fabrication. Coordinate fabrication to avoid delay of work. Correct Work as necessary to remediate dimensional conflicts and provide assemblies with acceptable capacity for installation with required fit and operating clearances.
1. Coordinate with work of section 05 50 00 for metal fabrications required to support operable fenestration assemblies provided by this Section.

1.5 WARRANTY

A. Special Warranty: Signed by authorized representative of the manufacturer, agreeing upon receipt of written notice of defective work, and work not in compliance with Project requirements to correct or replace the work to the satisfaction of the Owner, and at no cost to the Owner for the time periods required.
1. Project Installation: 10 years
2. Finish Durability: 20 years against loss of required match in appearance, fade, chalk and deterioration in excess of normal weathering when evaluated per AAMA 2605.

B. Installer Warranty: Signed by authorized representative of the General Contractor and fabricator-installer for work of this Section agreeing upon receipt of written notice of defective work, and work not in compliance with Project requirements to provide all labor necessary to correct or replace the work to the satisfaction of the Owner, at no cost to the Owner for the time periods required.

1. Project Installation: 3 years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Components with sections and profiles indicated. Design is based on specific type and model aluminum systems by a single manufacturer. .
   1. Assembly framing concealed from view at head and sill; only vertical stiles may be visible.
   2. Provide an integrated gutter assembly to collect, control and dispose of water occurring in the assembly.
   3. Coordinate assembly to receive locks as required by Section 08 71 00, and prepare frames for locks.

B. Performance Requirements: Comply with criteria of the General Structural Notes on S series drawings.
   1. Air Infiltration: 0.37 cubic feet per minute per lineal foot of joint at inward pressure of 6.24-pound force per square foot.
   2. Water Penetration: None at inward pressure of 15-pound force per square foot.
   3. Structural Performance: Support and anchor units to limit deflection to 0.0057 of span and comply with Performance Requirements of Section 08 81 00 for service conditions required.

2.2 MANUFACTURERS

A. Basis of design is CR Laurence Palisades S100 Sliding Door.

B. Substitution Request: Comply with procurement requirements; requests received after bid opening will be rejected.

2.3 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish; ASTM B 221 for extrusions, ASTM B 209 for sheet and plate.

B. Fasteners: Noncorrosive, compatible with metals fastened; Phillips flat-head machine screws for exposed fasteners.

C. Concealed Flashing: 26 gage dead-soft stainless steel, or 0.062 inch extruded aluminum, 0.062.

D. Brackets and Reinforcements: Non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.

E. Concrete/Masonry Insert: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.

F. Compression Weatherstripping: Molded neoprene gaskets complying with ASTM D 2000 or molded PVC gaskets complying with ASTM D 2287.

G. Sliding Weatherstripping: Replaceable stripping of wool, nylon woven pile, or polypropylene, with nylon fabric or aluminum strip backing, complying with AAMA 701.2.

H. Glass and Glazing: Comply with requirements of Section 08 81 00, provide Safety Glazing as required for the Work.

I. Hardware: Provide manufacturer's heavy duty top panel guide, bottom panel caster and miscellaneous components. Provide lockset and cylinder as required in Section 08710.
   1. Plates and Handles: Aluminum, of style indicated.
   2. Thresholds: Comply with barrier free access regulations for aluminum flor track, threshold and similar fabrications cross line of travel. Extruded aluminum, mill finish, with anchors and clips, coordinated with pivots and floor-concealed closers.

2.4 FABRICATION

A. Provide sizes, configurations, and profiles indicated, and scheduled with accurate relation of planes and angles, and hairline tight joints. Shop fabricate and assemble work to greatest extent possible using manufacturer's standard methods; disassemble only as necessary to ship and install; protect finishes from damage and deterioration.
   1. Coordinate with work of Section 08 71 00; prepare units for hardware and install in shop wherever possible, except drill and tap for surface-mounted hardware at Project site.
   2. Reinforce work as necessary for hardware mounting, and performance requirements.

B. Welding: Comply with AWS recommendations to avoid discoloration; grind exposed welds smooth and flush and restore finish.

C. Isolate dissimilar metals and incompatible materials, prevent galvanic action and corrosion.

D. Fasteners: Concealed, unless otherwise acceptable, except use exposed fasteners for surface mounted hardware.
   1. Exposed Fasteners: Countersunk, filled, ground flush and finished to match surface where later removal is not necessary; finish removable fasteners to match adjacent finish as directed.

E. Weatherstripping: Exterior openings and locations required; unless otherwise required, sliding type mortised into adjustable strip centered in door edge at stile and head rail, compression type at fixed stops. Provide silencers where weatherstripping is not required.
   1. Bottom Rail: Adjustable EPDM/vinyl blade gasket.
   2. Jamb of Center Pivot Door: Finger guards of collapsible neoprene or PVC anchored to frame.

F. Glazing System: Type indicated, design for reglazing from interior without disassembly
   1. Stops: Extruded aluminum with beveled top and projected fascia returned to door face unless otherwise indicated; nonremovable exterior stops, and snap-on interior stops.

2.5 FINISHES

A. High Performance Pigmented Organic Coating: AAMA 2605; 70 percent PVDF resin contents; non-metallic black as selected and to provide visual match to similarly finished work of Section 08 41 00.

B. Hardware Finishes: Comply with requirements of Section 08 71 00.

2.6 SOURCE QUALITY CONTROL

A. Test and certify storefront and entrance assembly compliance with Project performance requirements.
1. Wind Load: ASTM E 330.
2. Air Infiltration: ASTM E 283
3. Water Penetration: ASTM E 331
4. Thermal Transmission: U-value Btu/(hr x sf x degree F) AAMA 1503.1.
5. Condensation Resistance Factor: AAMA 1502.7.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation of aluminum entrances and storefronts.

B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Anchor securely in place, isolate incompatible metals and substrates, prevent corrosion and electrolysis.

C. Set sills and other members in sealant bed and provide joint fillers and gaskets as indicated to provide weathertight construction.

D. Drill and tap frames and doors and apply surface-mounted hardware items, complying with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

E. Field test installed work for compliance with performance requirements for air and water penetration using referenced standards as a guide.

3.2 ADJUST AND CLEAN

A. Adjust operating hardware to function properly, without binding, and to provide tight fit at contact points and weatherstripping.

B. Clean completed system, inside and out, promptly after erection and installation of glass and sealants. Remove excess glazing and joint sealants, dirt, and other substances from aluminum surfaces.

C. Protect work so that it is without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08 34 00 – SPECIAL FUNCTION DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes Interior Aluminum-Framed Top-Hung Sliding Doors.

B. Related Sections:
   1. Section 08 14 00 Wood Doors

1.3 REFERENCES

A. ANSI – American National Standards Institute
   1. ANSI 156.18 Materials and Finishes
   2. ANSI A117.1 Specifications for making buildings and facilities usable by physically handicapped people.

B. BHMA – Builders Hardware Manufacturers Association

C. DHI – Door and Hardware Institute

D. NFPA – National Fire Protection Association
   1. NFPA 80 – Fire Doors and Windows
   2. NFPA 101 – Life Safety code
   3. NFPA 105 – Smoke and Draft Control Door Assemblies
   4. NFPA 252 – Fire Tests of Doors Assemblies

E. AWS – Architectural Woodwork Standards

1.4 SUBMITTALS

A. Product Data: Submit manufacturer’s product data, including installation instructions.

B. Shop Drawings: Submit manufacturer’s shop drawings, including plans, elevations, sections, and details, indicating dimensions, tolerances, materials, components, hardware, finish, options, and accessories. Shop Drawings to show required blocking by others.

C. Samples: Submit manufacturer’s samples of the following sliding door components:
   1. Door veneer or laminate sample.
   2. Aluminum Frame finish sample.

D. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.

E. Warranty Documentation: Submit manufacturer’s standard warranty.

F. Test Reports: Submit acoustical reports or UL1784 as applicable.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of interior aluminum frames and doors.

B. Source: Obtain sliding aluminum framed doors and hardware from single source.

C. Manufacturer's Qualifications: Manufacturer regularly engaged for past 5 years in manufacture of sliding doors similar to that specified.

1.6 PERFORMANCE

A. Aluminum perimeter frames with integral acoustic seals at all door/frame interfaces
   1. Architect to verify frame thickness suitable for required application.

B. Soft-closing mechanism at both sides of door integrated with top track. Soft Closers tested to a minimum of 150,000 cycles.

C. Concealed door guide.

D. Manufacturer to 3rd party acoustical performance test data.

E. Manufacturer to submit 3rd party test data on air infiltration and/or smoke ratings as applicable.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Notify manufacturer immediately of any shipping damage.

C. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer’s instructions.
   2. Keep materials in manufacturer’s original, unopened containers and packaging until installation.
   3. Store materials in clean, dry area indoors.
   4. Protect materials and finish during storage, handling, and installation to prevent damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. AD Systems (Assa Abloy), RACO Interiors, Tubelight, or approved.

2.2 INTERIOR SLIDING ALUMINUM-FRAMED DOORS AND PARTITIONS

A. Manufacturer: Basis of Design is OfficeSlide™ High Performance Barn (Sliding) Door System by AD Systems.

B. Specified Wall Thickness: As indicated in Drawings and required by wall assembly.

C. Frame Profiles: Extruded aluminum frame “wrap” frame with integral vertical jamb (stile pocket).

D. Finish: Painted Hardcoat (Kynar) Finish. Meets AAMA 2604 Standard Colors: As selected by Architect.

E. Frame Profiles: Extruded aluminum
1. Standard: frame “wrap” frame with integral vertical jamb (stile pocket).
2. Profile Dimensions: As indicated in Drawings.

F. Door Leaves: all Doors to be factory machined for hardware including pilot and function holes.
1. Wood Doors: Reference Section 08 14 00 for Wood Doors.
2. Aluminum Stile & Rail Door: Manufacturer’s standard 1-3/4 inch thick glazed doors with extruded-aluminum tubular stile and rail members. Welded and bolted corner connections.
   a. 3-1/2 inch vertical stiles plus 1/2 inch stop.
   b. 3-1/2 inch Horizontal stiles plus 1/2 inch stop; provide 10-inch bottom rail where indicated or Scheduled in Drawings.
   c. Glazing: Glazing Type as Scheduled. . Reference Drawings and Section 08 81 00.

G. Door Components:
1. Single Top Track: Extruded aluminum track for both single and bi-parting doors, as indicated in Drawings and Schedule.
2. Valances: Extruded aluminum with integral end caps.
3. Top Rollers: Tandem nylon roller sized to match door weight.
4. Concealed Floor Guide: Integral Jamb floor guide by manufacturer.
5. Soft-Closers: Soft-closing dampener mechanism at both sides of door leaf.
6. Pull Handles: As Scheduled in Door Hardware. Where Pull is not indicated, provide as selected by Architect from manufacturer’s standards.
   a. Flush Pull and custom pull handle by request.

H. Door Locks and Finish Hardware: As Scheduled.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine wall openings to receive sliding doors for plumb, level, and square. Note: Finish door operation will be affected by out of tolerance framing.

B. Verify dimensions of wall openings.

C. Examine surfaces to receive top and bottom guide.

D. Notify Architect of conditions that would adversely affect installation or subsequent use of sliding doors.

E. Do not begin installation until unacceptable conditions are corrected.

F. Base of door side to be flush or minimal. Rubber Base acceptable.

3.2 INSTALLATION

A. Install sliding doors plumb, level, square, in proper alignment and in accordance with manufacturer's instructions.

B. Install sliding doors to open and close smoothly, with no visible gap between door and wall in closed position.

C. Anchor sliding doors securely in place to supports. Required: Fire treated 2 x 6 blocking required full length of track.

3.3 ADJUSTING

A. Adjust sliding doors to operate smoothly without binding and in accordance with manufacturer's instructions.

B. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

3.4 CLEANING AND PROTECTION

A. Clean sliding doors promptly after installation in accordance with manufacturer's instructions.

B. Do not use harsh cleaning materials or methods that could damage materials or finish.

C. Protect installed sliding doors from damage during construction.

END OF SECTION

SECTION 08 41 00 – ALUMINUM ENTRANCES AND STOREFRONT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for a weatherproof installation of aluminum entrances and storefronts.

B. Related Sections:
1. Section 08 71 00 Finish Hardware.
2. Section 08 81 00 Glass and Glazing.

1.2 SUBMITTALS

A. Shop Drawings: Prepared by the original manufacturer of the storefront components. Preparation by the site fabricator or installer is not acceptable. Elevations at 0.25-inch equals one foot scale, details at 3-inch equals one foot scale, full size sections of composite members; detail anchors, hardware, reinforcement, movement provisions, accessories, and glazing assembly.
1. The Contractor shall provide professional engineering services for work of this Section to comply with Design and Performance Requirements. Engineer shall be registered in the State of the Project and shall stamp and sign drawings and calculations prepared for this Project.

B. Samples: Demonstrate fabrication, design, operation and finish; provide two samples of each type as required.
1. Finishes: Apply to 12-inch sections of members required, use extrusion and alloy type required for final Work.
2. Assemblies: Typical joinery, and corner of custom units.

C. Quality Control Submittals: Demonstrate compliance with requirements.
1. Certificates: For performance of manufacturer's standard window units.
2. Test Results: For performance of window units as specified.

1.3 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of construction work by accurate field measurement before fabrication. Coordinate fabrication to avoid delay of work; when so directed fabricate units without field measurement, and coordinate installation tolerances for proper fit.

1.4 WARRANTY

A. Warranty: Signed by authorized representative of GC, the storefront manufacturer, and the installer agreeing upon receipt of written notice of defective work, and work not in compliance with the Contract Documents to correct or replace the work to the satisfaction of the Owner, and at no cost to the Owner for the time periods required.
1. Weatherproof Installation: 5 years.

2. Finish Durability: 10 years against loss of required match in appearance, fade, chalk and deterioration in excess of normal weathering when evaluated per AAMA 2605.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Final design of this assembly for resistance of imposed loads, and attachment to building structure is the responsibility of the Contractor. Components shall have the sections and profiles indicated. Design is based on aluminum systems of one manufacturer but may include modifications to standard components and custom fabrications as necessary for compliance with Project requirements. As determined by the Architect, aluminum systems of other manufacturers may be acceptable where deviations neither affect the Architect's design, nor detract from performance.
1. The Contractor shall provide final design, and engineering of internal reinforcing, external supports, and anchors for storefront and entrance assemblies to resist imposed loads and attach to the building structure at the locations indicated as work of this Section. Reinforcing, supports and anchors shall comply with requirements of this Section and Section 05 50 00.
2. As necessary to conform to the Architect's design, standard components and assemblies shall be modified and custom components provided at no additional cost to the Owner.

B. Performance Requirements: Accommodate dimensional tolerances for adjacent and supporting construction, thermal movement over temperature range of 120 degrees F; inward and outward wind load, and structural criteria as indicated in the General Notes on the Structural Drawings.
1. Fixed Frame: Air infiltration at 6.24 psf of 0.10 CFM/square foot; No uncontrolled water penetration at inward pressure of 12 psf.; condensation resistance factor (CRF) of 51, and a U-value of 0.65.
2. Assembly U-value equal to or better than U=0.38 and SHGC=0.40 and otherwise complying with California Energy Code (Title 24 Part 6) and applicable voluntary energy efficiency provisions in CALGreen (Title 24 Part aa) for unit sizes and configurations required with insulating glazing specified in Section 08 81 00 when evaluated per AAMA 507 as certified by NFRC.
   a. .Entrances: Assembly U-value equal to or better than U= 0.60
3. Operable Frame: Air infiltration of 0.10 CFM/linear foot of perimeter at air pressure differential of 6.24 psf; No uncontrolled water penetration at inward pressure of 12 psf; CRF not less than 51, and U-value of 0.65.
4. Structural Performance: Maximum deflection 0.0057 of span under design wind load and exposure condition for building configuration and elevations indicated. Neither glass breakage nor permanent set in excess of 0.2 percent of span at 35 psf live load.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish; ASTM B 221 for extrusions, ASTM B 209 for sheet and plate.

B. Fasteners: Noncorrosive, compatible with metals fastened; Phillips flat-head machine screws for exposed fasteners.

C. Concealed Flashing: 0.062-inch extruded aluminum, or 26 gage stainless steel.

D. Reinforcement, Supports and Anchorage: Galvanically compatible with aluminum components.
   1. Steel Reinforcement:
      a. Structural Shapes, Plates and Bars: ASTM A36/A36M.
      b. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
      c. Hot-rolled Sheet and Strip: ASTM 1011/A1011M.
   2. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Grade No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

E. Concrete/Masonry Insert: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.

F. Galvanic Isolation: Provide permanent isolation of contact and wash surfaces of non-compatible metal components to prevent galvanic action between dissimilar metals using manufacturer's approved system.

G. Compression Weatherstripping: Molded neoprene gaskets complying with ASTM D 2000 or molded PVC gaskets complying with ASTM D 2287.

2.3 MANUFACTURED COMPONENTS

A. Provide sizes, configurations, and profiles indicated, and scheduled with accurate relation of planes and angles, and hairline tight joints. Shop fabricate and assemble work to greatest extent possible using manufacturer's standard methods; disassemble only as necessary to ship and install; protect finishes from damage and deterioration.
   1. Storefront Systems: Subject to compliance with Project requirements, provide basis of design storefronts as manufactured by Oldcastle Building Envelope (OBE) or approved equal in locations indicated in Drawings:
      a. Series 6000 Center Set System (2 X 6-inch), having the following performance (combined framing plus glazing):
         1) Winter U-Factor: 0.373.
         2) Solar Heat Gain Coefficient (SHGC): 0.26.
         3) Visible Light Transmittance (VT): 0.59.
         4) Condensation Resistance: 53.
      b. Series 3000 Center Set System (2 X 4.5-inch) having the following performance (combined framing plus glazing):
         1) Winter U-Factor: 0.363.
         2) Solar Heat Gain Coefficient (SHGC): 0.25.
         3) Visible Light Transmittance (VT): 0.57.
         4) Condensation Resistance: 47.
      c. Series 3000 Storefront with U-Channel (2 X 4.5-inch).
   2. Reinforcing, Supports and Anchorage: Sized and configured for internal reinforcing of aluminum extrusions and for external support and anchorage as necessary for the Work. Coordinate work with aluminum frame assemblies and building structure for each configuration required. Comply with Performance Requirements for all loading conditions.
   3. Aluminum Entrance Frame and Stile and Rail Doors: Reference Section 08 42 24 Automatic Sliding Entrances and Section 08 71 00 for Finish Hardware.

B. Welding: Comply with AWS recommendations to avoid discoloration; grind exposed welds smooth and flush and restore finish.

C. Isolate dissimilar metals and incompatible materials, prevent galvanic action and corrosion.

D. Fasteners: Concealed, unless otherwise acceptable, except use exposed fasteners for surface mounted hardware.
   1. Exposed Fasteners: Countersunk, filled, ground flush and finished to match surface where later removal is not necessary; finish removable fasteners to match adjacent finish as directed.

E. Glazing System: Type indicated, design for reglazing from interior without disassembly.
   1. Stops: Extruded aluminum with beveled top and projected fascia returned to door face unless otherwise indicated; nonremovable exterior stops, and snap-on interior stops.

2.4 FINISHES

A. Provide Aluminum Finishes as indicated in Drawings:
   1. High Performance Pigmented Organic Coating: Eligible for the specified Project Warranty. AAMA 2605; apply to aluminum extrusions; match appearance as demonstrated by approved samples, and coordinate with related components specified in Section 07 62 00 and Section 08 42 29.
      a. Two coat, 70 percent fluorocarbon (PVDF) resin system with mica flakes; OBE/Valspar Standard, Premier or Custom Color as selected by Architect, where storefronts are indicated to match existing system finish
   2. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class 1, 0.018 mm or thicker.
      a. Color: Dark bronze to match Architect's sample.

2.5 SOURCE QUALITY CONTROL

A. Test and certify storefront and entrance assembly compliance with Project performance requirements.
   1. Wind Load: ASTM E 330.
   2. Air Infiltration: ASTM E 283
   3. Water Penetration: ASTM E 331
   4. Thermal Transmission: U-value: (Btu/hr x sf x degree F) AAMA 1503.1.
   5. Condensation Resistance Factor: AAMA 1502.7.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install aluminum frame storefront assemblies within the overall building envelope in which they occur so as to provide contiguous effective collection, control and drainage of moisture entering or otherwise occurring in cladding assemblies. Collect the moisture and conduct it to the exterior for drainage without adverse effect on the performance, durability and appearance of the assembly. Ensure continuity among water control features within the storefront and adjacent assemblies and provide a fully integrated system for the building envelope.
   1. Provide flashings and similar ancillary components for storefront installation as necessary to maintain continuity of water control features, and to provide effective

venting and drainage of concealed cavities. Flashing shall comply with Section 07 62 00 requirements.

B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Anchor securely in place, isolate incompatible metals and substrates, prevent corrosion and electrolysis.
   1. Coordinate installation of aluminum frame components with internal and external reinforcing, supports and anchors to ensure completed assembly can resist all imposed loads and complies with Performance Requirements.

C. Drill and tap frames and doors and apply surface-mounted hardware items, complying with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

D. The Owner reserves the right to test storefront work for compliance with performance requirements for resistance to air infiltration and water penetration in accordance with AAMA 503. Work failing to meet performance requirements will be determined to be defective.
   1. Repair, or replace defective Work as acceptable to the Owner.

3.2 ADJUST AND CLEAN

A. Adjust operating hardware to function properly, without binding, and to provide tight fit at contact points and weatherstripping.

B. Clean completed system, inside and out, promptly after erection and installation of glass and sealants. Remove excess glazing and joint sealants, dirt, and other substances from aluminum surfaces.

C. Protect work so that it is without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08 42 29 – AUTOMATIC SLIDING ENTRANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for fully automatic sliding entrances with operator, motion and presence sensors and controls. Coordinate electrical requirements of door control and operating hardware with Section 08 71 00 requirements for card key operation and security requirements. Work includes electrical service and connections necessary for normal operation of hardware.
   1. Low Energy Operators: Work of Section [08 71 10, 08 71 00].

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Provide coordination with work of the following Sections:
   1. Section 08 81 00 Glass and Glazing.
   2. Division 26 Electrical Sections.

1.3 SUBMITTALS

A. Product Data: Submit as required for each product to be incorporated into the Work, include information on electrical characteristics.
   1. Wiring Diagrams: For coordination with Division 26.

B. Samples: Finish samples to demonstrate required appearance match.

C. Templates: Furnish to fabricator of Work factory-prepared for hardware. Coordinate mounting heights and installation requirements for hardware.

D. Operation and Maintenance Manuals: Document routine maintenance and inspection procedures and frequency for each assembly type provided in the Work. Provide trouble shooting guidelines for diagnostic service. Provide for normal operation and highlight specific Project adaptations and features necessary for integration with building electronic safety and security systems. Provide for emergency operation and reset of breakaway panic leaves. Provide name, address, and contact information of the manufacturer providing the hardware and their nearest service representatives and the installing contractor.
   1. Tools: A complete set of specialized tools and instructions as necessary.

1.4 QUALITY ASSURANCE

A. Installer: Certified by the American Association of Automatic Door Manufacturers and approved by the manufacturer of the assemblies to be installed as an installer of their products and having five years successful experience with installation of high frequency, automatic sliding doors in the configurations required.

1.5 WARRANTY

A. Special Warranty: Signed by authorized representatives of the Manufacturer, Supplier and Installer of hardware providing for the prompt replacement of defective and non-compliant work, including actuators, sensors, electromechanical operators and other system components.
   1. Door Operators: Five years written warranty.
      a. Gear Boxes: Guaranteed for complete cost of replacement including installation.
   2. Glazing Installation: As required by Section 08 81 00.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Safety sensor, operator, header and track, jambs, sliding doors for single, bi-parting and telescoping configurations with fixed sidelights, in size and function required.
   1. Main entrance: Fixed sidelights and bi-parting sliding door leaves with breakout panic.
   2. Stile and Rail Doors: 4.5-inch stiles and head rail, 10-inch bottom rail; configure glazing channel for glazing Type required.
   3. Provide complete assemblies with all operating components, controls, hardware, weather seals and accessories.
   4. Digital Cycle Counter: Resettable, 8-digit capacity to track door operation cycles.

B. Performance Requirements: High energy, automatic operating door assemblies suitable for high frequency function and heavy traffic in apublic building having a minimum of 50,000 operating cycles per year.
   1. Comply with ANSI/BHMA A156.10 Standard for Power Operated Pedestrian Doors.
   2. Breakout Panic: Provide magnetic catch and hydraulic closer to return breakout leaf to normal position.

2.2 MANUFACTURED COMPONENTS

A. Subject to compliance with system Description requirements the basis of design is Stanley DuraGlide 2000 Series Bi-Parting Door assembly for Door Types as required, Horton Automatics, Assa Abloy Besam or approved.

B. Operating Mechanism: Drive operator concealed within the header, not larger than 4 inches by 6 inches tall with removable fascia.
   1. Microprocessor Control functions required by ANSI A156.10. Control shall provide for integration with building electronic safety and security systems as required for work of Section 28 13 10.
   2. Finger Safety: When unit slides open, strike rail of sliding panel will stop short of adjacent sidelite; resulting opening is net slide.

C. Security and Safety Power Fail Options: Monitored with battery back-up for user determined power failure response; doors may slide open or slide function will lock when door is closed at the user’s election.

D. Track: Aluminum, nylon covered, and replaceable. Rollers will be steel, high quality ball bearing wheels 1.25-inch diameter with continuous anti-derailing guide full length of panel travel.

E. Hardware: Coordinate with requirements of Section 08 71 00 and building electronic safety and security systems.
   1. Flush Panic Exit Device: Recessed in muntin bar.
   2. Threshold: Aluminum configured to comply with barrier free access requirements and as indicated.

F. Finish: Comply with requirements of Section 08 44 00 and match finished appearance of work of that Section.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mounting Heights: Comply with governing regulations, and Door and Hardware Institute, "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" unless otherwise required.

B. Install hardware level, plumb, and true to line and location, comply with the manufacturer's instructions and recommendations. Prevent conflicts between mounting heights for each component of hardware. Provide electrical service as necessary for hardware function.

C. Adjust and reinforce substrate as necessary for installation and operation, provide backing as wall mounted door stops and other surface mounted hardware; cut and fit as required for installation of hardware, and remove hardware prior to application of final finish; reinstall hardware once finishing is complete.
   1. Where Work cannot be reinforced for fasteners use sleeved through-bolt, or sex screw fastener.

D. Drill and countersink units not factory-prepared for fasteners. Space fasteners in accordance with industry standards.

E. Cut and fit floor covers to profile of door frames with mitered corners and hair-line joints. Join units with concealed welds or concealed mechanical joints. Permanently anchor thresholds to substrate with No. 10 or larger stainless-steel screws. Cut smooth openings for spindles, bolts and similar items as required.

3.2 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Inspect and adjust hardware one week prior to scheduled inspection for final acceptance and instruct Owner's personnel in adjustment and maintenance of hardware.

1. Clean operating items as necessary to restore proper function and finish of hardware and doors.
2. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

END OF SECTION

SECTION 08 63 00 – METAL FRAMED SKYLIGHTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for monumental, metal framed skylights.

B. Related Sections:
1. Section 07 62 00 Flashing and Sheet Metal.
2. Section 07 92 00 Joint Sealers.
3. Section 08 81 00 Glass and Glazing.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Participate in Preinstallation conference required for work of Section 07 54 19.

1.3 SUBMITTALS

A. Samples: Finished as required for Project; two frame sections 12 inches long, and one glazed corner section 12 by 12 inches incorporating curb anchors and other necessary fasteners, corner section will be returned.

B. Certificates: Demonstrate compliance with requirements.

C. Shop Drawings: Plans, sections, and details of joints, anchors, and flashing; analysis of stress points due to live loads, and thermal stress. Annotate modifications of manufacturer's standard systems necessary to comply with requirements; document field measurements and tolerances.
1. The Contractor shall provide professional engineering services for work of this Section to comply with System Description requirements. Engineer shall stamp and sign drawings and calculations prepared for this Project.
   a. Engineer Certification: Compliance with CBC Title 24 maximum deflections are within required limits and probable glass breakage will not exceed frequency specified in Section 08 81 00.
2. Show locations and details for skylight connections to building structure and loads imposed on building structure. Indicate coordination of tolerances for supporting structure and curtain wall supports. Document fastener type to be used. Highlight locations where self –drilling screws are proposed and note why other fastener type cannot be used.
3. Coordinate Glazing Schedule specified in Section 08 81 00.

1.4 QUALITY ASSURANCE

A. Manufacturer and Installer: One firm acting as a single source of supply for work of this Section. Firm shall have ten years successful experience as a manufacturer, and installer of skylights similar in scope and type to Work of the Project as demonstrated by the required certification.

B. Certificates:
1. Certified test results of standard unit similar to that proposed for used in the Project complying with performance requirements.
2. Five projects in place for two to five years, include date. location, and names of Foreman, Owner, and Architect.

1.5 PROJECT CONDITIONS

A. Field Measurements: Frame openings to receive skylights; prior to fabrication. Avoid delay of Project, where measurements cannot be made in required sequence provide erection tolerance corresponding with tolerances for work adjoining skylights. Give written notice to Contractor of unsatisfactory tolerances, and tolerances that exceed requirements.

1.6 WARRANTY

A. Special Warranty: Notarized, signed by manufacturer, and installer; skylight system, including flashings, and glazing will remain water-tight, free from defects in materials and workmanship, and not deteriorate in excess of normal weathering for a period of ten years from date of final acceptance, and agreeing upon receipt of written notice from the Owner to promptly repair, and replace any portion of the Work which does not perform as required; to the Owner's complete satisfaction, and at no cost to the Owner, nor change in contract amount.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Design of skylight structure, anchors, inserts, flashings, and accessories; spacing and profile of members as indicated. Minor deviations acceptable to the Architect may be permitted where they allow the use of manufacturer's standard products.
1. Horizontal loads shall not be translated to the curb by the skylight frame.
2. Weep closed sections and provide controlled drainage of free water to exterior at elevation above apron flashing using a cascading internal gutter system.
a. Water Control System: Designed for cold climate installation prevent ice dam blockage of drains and size gutters for elevated amounts of condensation that may be associated with the assembly occupancy of the space.
3. Comply with recommendation of AAMA Glass Design for Sloped Glazing.
4. Provide assemblies incorporating thermally broken aluminum components except as necessary to comply with structural requirements.

B. Performance Requirements: CBC Title 24 Chapter 16 and Section 2405; AAMA 501.2 Quality Assurance and Diagnostic Field Check of Sloped Glazing Systems, and source quality assurance tests on manufacturer's units to be incorporated into the Work.
1. Air Infiltration: 0.06 cfm/ft of sash joint at inward pressure of 6.24-pound force per square foot (lbf/sf).
2. Water Penetration: None at inward pressure of 8.00 lbf/sf.
3. Wind, Snow and Seismic Loading: Comply with criteria in General Structural Notes.
4. Deflection: Less than 1/175 of span for frame and glazing without failure nor permanent set under the required load conditions.
5. Impact: Comply with CBC Title 24 Part 2 Section2404.2 and CAL OSHA 1910.23 without the use of metal guards.

6. Thermal Performance: NFRC listed for overall U-Value of 0.43 when evaluated with insulating glazing units having a U-value of 0.29 or better. SHGC less than 0.6 per NFRC 200.

2.2 MANUFACTURERS

A. Subject to compliance with Project requirements manufacturers whose products may be incorporated into the Project: VELUX, DEAMOR Skylights and Supersky.

2.3 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for required performance, strength, durability, and finish.
1. Extrusions: ASTM B 221; tensile strength 22,000 psi., and 0.125 inch thick for primary frame and sash members.
2. Sheet: ASTM B 209, minimum performance properties of Alloy 5052, and not less than 0.040 inch thick.

B. Steel Plates, Bars, and Shapes: Manufacturer's standard formed, and fabricated units, comply with material requirements of Section 05 50 00.
1. Galvanizing: ASTM A 123, Grade 85; applied after fabrication to all steel components.

C. Fasteners: Compatible with metals fastened, type, grade, and class necessary, and as required; cadmium plated steel, or other non-corrosive metal except non-magnetic stainless steel where exposed to moisture.

D. Sealant: Comply with requirements of Section 07 92 00; not permitted along rafter line.
1. Sealant Within Fabricated Units: Permanently elastic, non-shrinking, non-migrating, and recommended by manufacturer for optimal performance in necessary joint size and movement.

2.4 COMPONENTS

A. Concealed Flashing: 26 gage dead-soft stainless-steel compatible with contact metals.

B. Exposed Flashing Gutters: Aluminum sheet, and extrusions finished to match frame.

C. Glazing: Outside glazed, dry system; reglazing shall not require interior access; comply with requirements of Section 08 81 00.
1. Gaskets: 50-Durometer extruded neoprene mechanically interlocked into the skylight rafter bar and cap extrusions; setting surface and waterproof seal against both surfaces of the glass.

D. Provide accessory components necessary and required for complete, weathertight installation complying with specified requirements regardless of whether indicated or not, including but not limited to the following.

E. Electrochromic Glass: Product of Sage Electrochromics as necessary to comply with performance requirements for insulating sloped daylighting glazing.

F. Laminated Light: Provided as required for Electrochromic Insulating Slope Daylighting Glazing consisting of 0.125 inch thick clear fully tempered glass with two 0.015-inch thick

Vanceva interlayers 'Smoke Gray' and 'Cool White' and 0.030-inch thick clear polyvinyl butyral interlayer and as otherwise necessary for compliance with performance requirements for IGU.

2.5 FABRICATION

A. Skylight Frames: Match existing skylight scheduled for demolition in form, panelization and general character; provide aluminum extrusions of sizes, profiles and configuration indicated, where not indicated, provide manufacturer's standard; shop assemble, and glaze work to the greatest degree possible, disassemble only as necessary for shipment and installation; minimize field cutting, splicing, sealing and finishing.

B. Maintain continuity of line and accurate relation of planes and angles. Remove arrises from cut edges, radius edges and corners 0.01565 inch.

C. Prevent corrosion of skylight assembly and adjoining Work; isolate galvanically active metals, and incompatible materials.

D. Welds: Comply with AWS recommendations. Use method and material which will prevent discoloration of exposed work, grind exposed welds smooth and flush, and restore finish.

E. Joints: Securely attached and supported; hairline fit between contacting members of mechanical joints. Ensure free movement between surfaces where thermal, and deflection movement is intended, prevent freeze-up of joint.

F. Fasteners: Concealed unless otherwise acceptable to Architect; where exposed fasteners are acceptable use countersunk Phillips screws, finished to match item fastened.

G. Reinforce work at joints, attachments for other work, and points of support as necessary to comply with performance requirements.
   1. Aluminum members less than 0.125 inch thick: reinforced for fastener, and anchor attachments.

H. Finish: Shop applied to exposed components after fabrication of metal work, sequence to minimize differences between members; uniform overall appearance, variation of paint color and texture will not be accepted.
   1. High Performance Fluorocarbon Coating: AAMA 2605, 70 percent resin content and complying with requirements of Section 08 44 00 for matching appearance to finish work of that Section.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify curbs and assemblies supporting skylights have been coordinate correctly and are ready for skylight installation. Verify coordination with roof assembly, flashing and other weatherproofing components.

3.2 INSTALLATION

A. Install work weathertight, level, plumb, and true, uniform in appearance, with tight joints, sealant reveals, and features indicated; permanently anchor to structure with galvanically compatible, noncorrosive components to comply with performance requirements, and permit necessary movements.
   1. Prevent damage to skylight during installation. Use erection equipment and sequence that will not damage skylight, nor compromise performance, of installed work including glazing and finishes.
   2. Provide protection to prevent damage to roof structure, and other Work during skylight installation.

B. Do not install irregular, damaged, nor defective material, glazing exhibiting edge damage, and material with damaged finishes; do not damage appearance, nor performance of component parts, and skylight assembly due to field fabrication and installation.
   1. Repair of Component Parts: Performed in shop, replace components that cannot be returned to shop and repaired.

C. Provide concealed gaskets, sealants, fillers, pads and sleeves for permanently weathertight assembly, unrestrained at joints intended to accommodate thermal and deflection movements.
   1. Prevent corrosion between galvanically active components, and incompatible materials.
   2. Comply with requirements of Section 07 92 00 for sealers.
   3. Coordinate installation with flashing provided as work of Section 07 62 00 to ensure continuity of components as required for control, collection and drainage to exterior of water entering and occurring within skylight assembly.

D. Keep weeps, gutters, and cavities clean, and free of debris; remove debris as work progresses, use temporary closures to prevent accumulation.
   1. Clean skylight including glazing, remove excess glazing and sealing compound, dirt, and other substances.

3.3 TOLERANCES

A. Maximum Variation from Plumb, Level and Angle: 0.25 inch in 40 feet, and 0.125 inch in 10 feet, except 0.125 inch in 20 for horizontal runs.

B. Maximum Variation in Location: 0.375 inch any member, any location, and 0.125 inch in any 10-foot run.

C. Offsets in Edge-to-Edge, and End-to-End Alignments: 0.125 inch, except 0.0625 inch for members designed to be out-of-flush 0.5 inch and less, and members separated by 2 inches or less.

D. Measurement: Taken from established lines and levels.

E. Provide field testing on five percent of installed area in locations directed complying with AAMA 502 for evaluation of sloped glazing system compliance with System Description requirements. Depending upon initial test results, Architect reserves the right to require testing of more than five percent of installed area without change in contract amount.

F. Protect installed skylights from damage and deterioration other than normal weathering throughout contract time, until final acceptance of work.

END OF SECTION

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes items known commercially as door or finish hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following, but is not necessarily limited to:
1. Door hardware, including electric hardware.
2. Storefront and Entrance door hardware.
3. Low-energy automatic operators and actuators.
4. Gate hardware.
5. Card reader access control devices.
6. Power supplies for electric hardware.
7. Thresholds, gasketing and weather-stripping.

C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.
1. Division 08: Section - Hollow Metal Doors and Frames.
2. Division 08: Section - Wood Doors.
3. Division 08: Section - Aluminum-Framed Storefronts.
4. Division 08: Section - Automatic Sliding Doors.
5. Division 28: Section - Electronic Access Control.

1.3 REFERENCES

A. 2022 California Building Code, CCR Title 24, Part 2

B. BHMA - Builders' Hardware Manufacturers Association

C. DHI - Door and Hardware Institute

D. NFPA - National Fire Protection Association.
1. NFPA 80 - Fire Doors and Other Opening Protectives
2. NFPA 105 - Smoke and Draft Control Door Assemblies

E. UL - Underwriters Laboratories.
1. UL 10C - Fire Tests of Door Assemblies
2. UL 305 - Panic Hardware

F. WHI - Warnock Hersey Incorporated

G. SDI - Steel Door Institute

1.4 SUBMITTALS & SUBSTITUTIONS

A. General: Submit in accordance with Conditions of the Contract and Division 01 Specification sections.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit electronic PDF copies of schedule organized vertically into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
1. Include a Cover Sheet with:
   a. Job Name, location, telephone number.
   b. Architects name, location and telephone number.
   c. Contractors name, location, telephone number and job number.
   d. Suppliers name, location, telephone number and job number.
   e. Hardware consultant's name, location and telephone number.
2. Job Index information included:
   a. Numerical door number index including; door number, hardware heading number and page number.
   b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   c. Manufacturers' names and abbreviations for all materials.
   d. Explanation of abbreviations, symbols, and codes used in the schedule.
   e. Mounting locations for hardware.
   f. Clarification statements or questions.
   g. Catalog cuts and manufacturer’s technical data and instructions.
3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number - HW Group #1)				
(a) 1 Single - Door #101 - Corridor 101 to Exterior			(b) 90°	(c) RH
(d) 3'-0" x 7'-0" x 1-3/4" - Wood Door x Hollow Metal Frame - 20 Minute				
(e) 1.	(f) 3 ea	(g) Hinges - (h) 5BB1 4.5 x 4.5 NRP (i) 1/2 TMS	(j) 630	(k) IVE
2.	1 ea	Lockset - ND80P6D x RHO x RH x 10-025 x JTMS	626	SCH
3.	1 ea	Closer - 4040XP x EDA x TBSRT	689	LCN

a) Single or pair of doors with opening number and location.
b) Degree of opening.
c) Hand of door(s).
d) Door/frame dimensions and material; Label requirements, if any.
e) Hardware item line # (Optional).
f) Quantity.
g) Product description.
h) Product part number.

i) Fastenings and other pertinent information.
j) Hardware finish codes per ANSI/BHMA A156.18.
k) Manufacturer abbreviation.

D. Make substitution requests in accordance with Division 01. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.

F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

I. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

J. LEED Certification Points: Submit information and certifications necessary to achieve maximum points for LEED certification; coordinate and cooperate with Owner and Architect in providing information necessary for required LEED rating.

1.5 QUALITY ASSURANCE

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing.
3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree

of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

1.6 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

1.7 WARRANTY

A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:

1. Locksets: Ten (10) years.
2. Exit devices: Ten (10) years.
3. Closers: Thirty (30) years.
4. Automatic Operators: Two (2) years.
5. Electronic: Three (3) years.
6. All other hardware: Two (2) years.

1.8 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.9 PRE-INSTALLATION CONFERENCE

A. Convene a pre-installation conference at least one week prior to beginning work of this section.

B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key Owner's Personnel, and Project Inspector.

C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review Owner's keying standards.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Item	Manufacturer	Acceptable Substitutes
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	Or Approved Equal
Exit Devices	Von Duprin	Or Approved Equal
Closers	LCN	Or Approved Equal
Flush Bolts & Coordinators	Ives	Trimco
Push, Pulls & Protection Plates	Ives	Trimco
Door Stops	Ives	Trimco
Overhead Stops	Glynn-Johnson	Or Approved Equal
Seals, Bottoms & Thresholds	Zero	Pemko, NGP

2.2 MATERIALS

A. Hinges:
1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Hinges shall be sized in accordance with the following:
   a. Height:
      1) Doors up to 42" wide: 4-1/2 inches.
      2) Doors 43" to 48" wide: 5 inches.
   b. Width: Sufficient to clear frame and trim when door swings 180 degrees.
   c. Number of Hinges: Provide 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.
3. Exterior out-swinging hinges shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.
4. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.
5. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.

B. Continuous Hinges:
1. Provide aluminum geared continuous hinges fabricated from 6063-T6 aluminum conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
3. Provide continuous hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
4. Provide continuous hinges 1” shorter in length than nominal height of door, unless otherwise noted, with symmetrical hole pattern.
5. Install continuous hinges with fasteners supplied by manufacturer.

C. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" lever design.
   1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
   2. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
      a. Abusive locked lever torque – minimum 3,100 inch-pounds without gaining access.
      b. Offset lever pull – minimum 1,600 foot pounds without gaining access.
      c. Vertical lever impact – minimum 100 impacts without gaining access.
      d. Cycle Test – tested to minimum 16 million cycles with no visible lever sag; without the use of performance aids such as set screws or spacers.
   3. Cylinders: Refer to “KEYING” article, herein.
   4. Provide locks with standard 2-3/4” backset, unless noted otherwise, with 1/2” latch throw. Provide proper latch throw for UL listing at pairs.
   5. Provide locksets with separate solid steel anti-rotation thru-bolts, and no exposed screws.
   6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
   7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
   8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
   9. Provide levers with vandal resistant technology as scheduled for use at abusive applications.
   10. Provide wired electrified options as scheduled in the hardware sets.
      a. 12 or 24 volt DC auto-detecting operating capability.
      b. Selectable EL (fail safe) or EU (fail secure) operating mode via switch on chassis.
      c. 0.23A (230mA) maximum current draw.
      d. 0.01A (10mA) holding current.
      e. Modular request to exit (RX) switch.

D. Exit devices: Von Duprin as scheduled.
   1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
   2. Provide certificate by independent testing laboratory that device has completed over 1,000,000 cycles and can still meet ANSI/BHMA A156.3 standards.
   3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
   4. Provide exit devices cut to door width and height. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
   5. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
   6. Provide flush end caps for exit devices.
   7. Exit devices shall comply with CBC Section 11B-404.2.7 and shall be mounted between 34" and 44" above the finished floor surface.
   8. Provide exit devices UL certified to meet 5 lbs. maximum unlatching force requirements according to the CBC Section 11B-309.4.
   9. Cylinders: Refer to “KEYING” article, herein.
   10. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
   11. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
   12. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide exit devices with manufacturer's approved strikes.
15. Provide electrified options as scheduled.

E. Closers: LCN as scheduled.
1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Provide certificate by independent testing laboratory that door closers have completed over 10,000,000 cycles and can still meet ANSI/BHMA A156.4 standards.
4. Cylinder Body: 1-1/2" diameter with 3/4" diameter double heat-treated pinion journal.
5. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120° F to -30° F.
6. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
7. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
8. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
9. Pressure Relief Valve (PRV) Technology: Not permitted.
10. Provide door closers powder coated to match balance of door hardware. Powder coating finish shall be certified to exceed 100 hours salt spray testing as described in ANSI/BHMA A156.4 and ASTM B117.
11. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

F. Electro Mechanical Automatic Operators: LCN Senior Swing as scheduled.
1. Provide low energy automatic operator units that are electro-mechanical design complying with ANSI/BHMA A156.19.
2. Opening: Powered by DC motor working through reduction gears.
3. Closing: Spring force.
4. Manual, hydraulic, or chain drive closers: Not permitted.
5. Operation: Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment.
6. Cover: Aluminum.
7. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 2 to 30 seconds, and logic terminal to interface with accessories, mats, and sensors.
8. Provide drop plates, brackets, or adapters for arms as required to suit details.
9. Provide hard-wired actuator switches for operation as specified. Provide weather-resistant actuators at exterior applications.
10. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
11. Provide caution signs as described in ANSI/BHMA A156.19.

G. Flush Bolts & Dust Proof Strikes:
1. Automatic flush bolts shall be of the low operating force design.
2. Provide top bolt only model for interior doors where applicable and as permitted by testing procedures.
3. Provide dust proof strikes at openings using bottom bolts.
4. Manual flush bolts shall only be permitted on storage or mechanical openings, as scheduled.

H. Door Stops:
1. Unless otherwise noted in hardware sets, provide floor or wall type with appropriate fasteners. Where neither floor or wall type can be used, provide overhead type.
2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
3. Provide backing plate at wall framing behind wall type.
4. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions. Stop-only function shall be provided at fire-rated openings.

I. Protection Plates:
1. Provide kick, mop, and/or armor plates minimum of 0.050” thick, with four beveled edges. Furnish with sheet metal or wood screws, finished to match plates.
2. Kick plates shall be sized 10" high and 2" less door width (LDW) at single doors and 10” high and 1” LDW at pairs or doors.

J. Thresholds: As scheduled and per details.
1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope. Thresholds shall comply with CBC Section 11B-404.2.5.
2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 07 “Thermal and Moisture Protection”.
3. Use 1/4” fasteners, red-head flat-head sleeve anchors (SS/FHSL).

K. Seals: Provide silicone gasket at all rated and exterior doors.
1. Smoke & Draft Control Doors: Provide UL10C Classified gasketing that complies with NFPA 80 & NFPA 252 for use on “S” labeled Positive Pressure door assemblies.

2.3 KEYING

A. Furnish a Proprietary Schlage masterkey system as directed by the Owner or architect. Key system to be designated and combinated by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer.

B. A detailed keying schedule is to be prepared by the Owner and/or architect in consultation with a representative of Allegion or an Authorized Key Center or Authorized Security Center. Each keyed cylinder on every keyed lock is to be listed separately showing the door #, key group (in BHMA terminology), cylinder type, finish and location on the door.

C. Furnish all cylinders in the Schlage Full Size Interchangeable Core (FSIC) style. Pack change keys independently (PKI).

D. Furnish construction keying for doors requiring locking during construction.

E. Furnish all keys with visual key control.

1. Stamp key “Do Not Duplicate”.
2. Stamp (BHMA) key symbol on key.
3. Stamp unique owner identifier from the key bow.

F. Furnish mechanical keys as follows:
1. Furnish 2 cut change keys for each different change key code.
2. Furnish 1 uncut key blank for each change key code.
3. Furnish 6 cut masterkeys for each different masterkey set.
4. Furnish 3 uncut key blanks for each masterkey set.
5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
6. Furnish 1 cut control key cut to each SKD combination.

G. Furnish Schlage Padlocks and the cylinders to tie them into the masterkey system for gates, storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.
1. Furnish KS43F3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (FSIC core) with padlock above.

H. Furnish one Schlage cabinet lock for each cabinet door or drawer so designated on the drawings or keying schedule to match the masterkey system.
1. Furnish CL777R for use with FSIC Schlage cylinders.

2.4 FINISHES

A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.5 FASTENERS

A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.

B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

D. Provide expansion anchors for attaching hardware items to concrete or masonry.

E. All exposed fasteners shall have a phillips head.

F. Finish of exposed screws to match surface finish of hardware or other adjacent work.

G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

C. Fire-Rated Door Assembly Inspection: Upon completion of the installation, all fire door assemblies shall be inspected to confirm proper operation of the closing device and latching device and that only the manufacturer's furnished fasteners are used for installation and that it meets all criteria of a fire door assembly per NFPA 80 (Standard for Fire Doors and Other Opening Protectives). A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The inspection of the swinging fire doors shall be performed by a certified FDAI (Fire Door Assembly Inspector) with knowledge and understanding of the operating components of the type of door being subjected to the inspection. The record shall list each fire door assembly throughout the project and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by DHI. Operating hardware shall be located between 34" and 44" above finish floor to comply with CBC Section 11B-404.2.7.

D. Door Closers:
1. Place door closers inside building, stairs, rooms, etc. Closers shall be installed to permit doors to swing 180 degrees or maximum allowable by conditions.
2. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors.
3. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal.
4. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
5. Compensating devices or automatic door operators may be utilized to meet the above standards.
6. Per CBC Section 11B-404.2.8.1, doors shall take minimum of 5 seconds to move from an open position of 90 degrees to 12 degrees to the latch jamb.

E. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

G. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

H. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

I. Electronic Hardware:
1. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.
2. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.
3. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.
4. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.
5. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer’s technical documentation.

3.3 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.4 HARDWARE LOCATIONS

A. Conform to CCR, Title 24, Part 2; ADA Standards; and the drawings for access-compliant positioning requirements for the disabled.

3.5 Field quality control

A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.6 HARDWARE SCHEDULE

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.

C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

MANUFACTURERS ABBREVIATIONS

GLY	=	Glynn-Johnson	Overhead Stops
IVE	=	Ives	Hinges, Door Pulls, Flush Bolts, Coordinators, Door Stops, Kick Plates & Silencers
LCN	=	LCN	Door Closers & Automatic Operators
LOC	=	Locinox	Gate Closers
SAT	=	Stanley Access	Automatic Sliding Doors
SCH	=	Schlage Lock	Locks, Latches & Cylinders
VON	=	Von Duprin	Exit Devices
ZER	=	Zero International	Thresholds, Gasketing & Weather-stripping

HW GROUP NO. 01

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-98-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 12" O	630-316	IVE
1	EA	SURF. AUTO OPERATOR	9542IQ TLS COV AS REQ (115V)	628	LCN
2	EA	ACTUATOR	8310-836T	630	LCN
2	EA	BOLLARD POST	8310-866FLA (WHERE SHOWN ON DRAWINGS)	689	LCN
1	SET	WEATHERSTRIP	SEALS BY DOOR/FRAME MFR		
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER
1	EA	POWER SUPPLY	PS902 900-4RL 120/240 VAC	LGR	SCE
		CARD READER	BY WORK OF DIVISION 28		

HW GROUP NO. 02

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	PA-AX-98-NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	FLOOR STOP	FS444	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

HW GROUP NO. 03

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	PANIC HARDWARE	PA-AX-9850WDC-L-06-LBL-SNB	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 HEDA FPC (ON RHR LEAF)	689	LCN
1	EA	SURFACE CLOSER	1461 SHCUSH FPC (ON LHR LEAF)	689	LCN
1	EA	FLOOR STOP	FS436	626	IVE
2	EA	MEETING STILE	328AA	AA	ZER
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
2	EA	AUTO DOOR BOTTOM	364AA	AA	ZER
1	EA	THRESHOLD	164A (WHERE CARPET OCCURS)	A	ZER

HW GROUP NO. 04

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
5	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	AUTO FLUSH BOLT	FB31T	630	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	1461 FPC	689	LCN
2	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
1	EA	ASTRAGAL	383AA	AA	ZER
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 05

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 RW/PA FPC	689	LCN
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 06

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 HW/PA FPC	689	LCN
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 07

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8	652	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
1	EA	AUTO DOOR BOTTOM	364AA	AA	ZER
1	EA	THRESHOLD	164A (WHERE CARPET OCCURS)	A	ZER
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 08

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 09

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
1	EA	AUTO DOOR BOTTOM	364AA	AA	ZER
1	EA	THRESHOLD	164A (WHERE CARPET OCCURS)	A	ZER

HW GROUP NO. 10

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 SHCUSH FPC	689	LCN
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
1	EA	AUTO DOOR BOTTOM	364AA	AA	ZER
1	EA	THRESHOLD	164A (WHERE CARPET OCCURS)	A	ZER

HW GROUP NO. 11

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	DUTCH DOOR BOLT	054	626	IVE
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	WALL STOP/HOLDER	WS45	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 12

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/IND	ND40S RHO OS-OCC	626	SCH
1	EA	SURFACE CLOSER	1461 RW/PA FPC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 13

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/IND	ND40S RHO OS-OCC	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FPC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 14

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/IND	ND40S RHO OS-OCC	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 15

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	DOOR PULL	8103EZHD 10" F	630-316	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	1461 EDA FPC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		

HW GROUP NO. 16

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/IND	ND40S RHO OS-OCC	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
1	EA	COAT HOOK	543	630	IVE

HW GROUP NO. 17

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8	652	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 18

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80JD RHO	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW GROUP NO. 19

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8	652	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 SHCUSH FPC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 20

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
5	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8	652	IVE
1	EA	CONST LATCHING BOLT	FB61T	630	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 HW/PA FPC (ON ACTIVE LEAF ONLY)	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FLOOR STOP	FS436	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 21

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	630	IVE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FPC	689	LCN
1	SET	WEATHERSTRIP	SEALS BY DOOR/FRAME MFR		
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 22

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	GATE CLOSER & HINGE	MAMMOTH180-ZILV	AL	LOC
1	EA	PANIC HARDWARE	CD-OUT-PA-AX-98-NL-WH	630	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	26-091 ICX XQ11-948	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	FLOOR STOP	FS444	626	IVE

HW GROUP NO. 23

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	AUTOMATIC SLIDING DOOR	DURA-GLIDE 2000 SERIES, REFER TO SECTION 08 42 29		SAT
		CARD READER	BY WORK OF DIVISION 28		

HW GROUP NO. 24 - HARDWARE BY SLIDING DOOR MANUFACTURER

HW GROUP NO. 25 - NOT USED

HW GROUP NO. 26

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-98-NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURF. AUTO OPERATOR	9542IQ TLS COV AS REQ (115V)	628	LCN
2	EA	ACTUATOR	8310-836T		LCN
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER
1	EA	POWER SUPPLY	PS902 900-4RL 120/240 VAC	LGR	SCE
		CARD READER	BY WORK OF DIVISION 28		

HW GROUP NO. 27

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-PA-AX-9850WDC-L-BE-M996-06-FSE-LBL-SNB	626	VON
1	EA	ELEC PANIC HARDWARE	RX-PA-AX-9850WDC-L-M996-06-FSE-LBL-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	1461 HEDA FPC	689	LCN
2	EA	FLOOR STOP	FS436	626	IVE
2	EA	MEETING STILE	328AA	AA	ZER
1	EA	BULB SEAL	BY ALUMINUM FRAME MFR		
2	EA	AUTO DOOR BOTTOM	364AA	AA	ZER
1	EA	THRESHOLD	164A (WHERE CARPET OCCURS)	A	ZER
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		

HW GROUP NO. 28

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	DOOR CORD	798C-18	626	SCE
1	EA	EU STOREROOM LOCK	ND80JDEU RHO RX 12/24 VDC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		
			RE-USE BALANCE OF EXISTING HARDWARE		

HW GROUP NO. 29

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM LOCK	ND80JD RHO	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	6400 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	1461 SCUSH FPC	689	LCN
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	AUTO DOOR BOTTOM	351AA	AA	ZER
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		
			RE-USE BALANCE OF EXISTING HARDWARE		

HW GROUP NO. 30

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	DOOR CORD	798C-18	626	SCE
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-98-NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FPC	689	LCN
		CARD READER	BY WORK OF DIVISION 28		
		POWER SUPPLY	BY WORK OF DIVISION 28		
			RE-USE BALANCE OF EXISTING HARDWARE		

HW GROUP NO. 31

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
	CARD READER	BY WORK OF DIVISION 28		
		BALANCE OF HARDWARE BY AUTOMATIC SLIDING DOOR MFR		

- END OF SECTION -

SECTION 08 81 00 – GLASS AND GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for shop and field glazing of frames, doors and openings throughout the Project.
   1. Install glazing gaskets furnished by other Sections.

B. Related Sections:
   1. Section 08 14 00 Wood Doors.
   2. Section 08 32 13 Glazed Sliding Stacking Doors.
   3. Section 08 34 00 Special Function Doors.
   4. Section 08 41 00 Interior Aluminum Entrances and Storefront.
   5. Section 08 42 29 Automatic Sliding Entrances.
   6. Section 08 63 00 Metal-Framed Skylights.
   7. Section 10 23 10 Glazed Interior Wall Systems.

C. Definitions:
   1. Hazardous Locations: California Building Code Title 24 Part 2 Section 2406.4.1 through 2406.4.7.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Coordinate with requirements of Section 08 41 00 for glazing of aluminum fenestration assemblies, Section 08 63 00 for glazing of skylights and coordination with other components and assemblies of the building cladding,
   1. Review and confirm Contractor's Project Schedule and work sequence.
   2. Integration of glazing provided as work of this Section with casework assemblies including but not necessarily limited to those indicated on A###, A### and A###.
   3. Coordinate fittings, glass preparation and installation requirements with work of steel fabrications for glazing at interior glass wall partitions.

1.3 SUBMITTALS

A. Product Data: Required for each product to be incorporated into the Work.

B. Shop Drawings: Provide for each glazing assembly required.
   1. Calculations: Provide for Exterior and Interior glazing assemblies to demonstrate compliance with Performance Requirements.
   2. Glazing Assembly Schedule: Coordinated with submittals required in Section 08 41 00 and Related Sections referenced above; indicate glazing assembly to be provided for each frame and location on the building.

C. Samples: Two samples nominal 12 inches by 12 inches for each glazing assembly required for the Work.
   1. Provide individual samples of glass products being incorporated into glazing assembly as directed and as otherwise necessary to demonstrate material compliance with Source Quality Control color and distortion testing requirements.

2. Glazing Film First in Place Sample: In location directed provide sample for review and acceptance of installation and appearance prior to start of final work.

D. Certificates: Document that glazing materials furnished comply with Project requirements.

1.4 QUALITY ASSURANCE

A. Contractor responsibility to provide Work complying with contract requirements shall not be altered by statements made in referenced standards and documents.
1. Flat Glass Marketing Association Glazing Manual.
2. Safety Glazing Standard: Comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

B. Fabricator and Installer Qualifications: Ten years successful experience with fabrication and installation of glazing work similar in material, design, and extent to that required for this Project. When directed provide records of representative work including warranty and in-service performance of previous work.
1. Glaziers for this Project: Certified under the National Glass Association, Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
2. Applicator of field applied glazing film, certified by the manufacturer as qualified to perform the installation required.

1.5 DELIVERY STORAGE AND HANDLING

A. Store and handle products in accordance with written recommendations of manufacturer, and fabricator, and to prevent damage to glass, including edges.

1.6 WARRANTY

A. Special Warranty for Glazing: Signed by the Fabricator, and agree to furnish replacements for defective glazing at no cost to the Owner for the glazing assembly types and time periods below. Defective glazing includes, but is not limited to, failure due to weakening edge characteristics shown identified in FGMA Glazing Manual, and as determined by the Architect.
1. Laminated Glazing: Five years.

B. Special Warranty for Installation: Signed by glazier and installer of work of related Section to receive the glazing assembly agreeing upon receipt of written notice of defective work and work not in compliance with Project requirements to provide all labor necessary to install replacement glazing furnished by the fabricator at no cost to the Owner for the warranty term.
1. Warranty Term: Three years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Glazing when installed in the required assembly capable of withstanding the stresses imparted in accordance with the Performance Requirements, IBC Chapter 24 Glass and Glazing requirements, and service conditions reasonably anticipated for the Work without deterioration, damage or failure.

1. Contractor shall analyze Project loads, glazing assembly sizes and configurations and in-service conditions and provide glass of the thickness and type required for each assembly as necessary to comply with Code requirements and ASTM E 1300 for required criteria. In no case shall glass be less than 0.25 inch thick. Provide heavier glazing, heat treated glass and laminated units as necessary to resist stresses and forces incidental to the required conditions of service.
2. Glazing in Hazardous Location as defined in this Section shall comply with Performance Requirements for Safety Glazing.
3. Sealant: Provide clear silicone sealant complying with Section 07 92 00 requirements; provide structural grade sealant where required for joint type or configuration indicated. Exposed edges of glazing shall be polished and finished smooth, edge of laminated glazing not captured by framing shall be fully covered by sealant.

B. Performance Requirements: For loads conforming to the criteria in the General Structural Notes and as follows.
1. Deflection Limit: Comply with CBC Section 2403.3 for Exterior assemblies and Section 2403.4 for Interior assemblies.
2. Probability of Breakage for Vertical Glazing: 8 lights per 1000 for lights set not more than 15 degrees off vertical and under wind action with 60 second load duration.
3. Probability of Breakage for Sloped Glazing: 1 light per 1000 for lights set more than 15 degrees off vertical and under wind load with 60 second duration, except 5 days for snow load.
4. Safety Glazing: ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials. Field applied films are not acceptable for compliance with this requirement.
5. Sound Transmission Loss of Acoustic Glazing: Glazing assembly having ASTM E90 STC value necessary for the glazed assembly to comply with required performance values when evaluated per ASTM E966.

2.2 MATERIALS

A. Glazing Assemblies: Product of one fabricator for each type required. Fabricate glass to sizes necessary for glazing of openings as required, with edge clearances and tolerances complying with recommendations of glass manufacturer and requirements of this Section.

B. Primary Glass Products: Product of one manufacturer for each variety; comply with ASTM C 1036.
1. Clear Float Glass: Type I, Class 1, Quality q3.

C. Heat-Treated Primary Glass Products: ASTM C 1048, by horizontal method with roller wave distortion parallel to bottom edge of glass. Provide fully tempered glass for glazing in hazardous locations except where laminated safety glazing is required. Heat treat glass where necessary to resist thermal stresses induced by differential shading of individual glass lights and for all lights 35 square feet and larger. Fabricate to size and configuration required with penetration and edge work completed prior to heat treating.
1. Tempered Safety Glazing: Comply with Performance requirements.

D. Coated Glass: Provide for clear float glass and other substrates as necessary for the performance and appearance required; coating on number 2 surface except as required for pyrolytic Low-E coating.
1. Low-E 1: Neutral color, Vitro Solarban 70, or approved.
2. One-inch, Low-E Insulating Glass Unit to meet the following (minimum) performance standards:

a. Winter Nighttime NFRC / U-Value: 0.28.
b. Solar Heat Gain Coefficient (SHGC): 0.27.
c. Light to Solar Gain (LSG) ratio of 2.33.
d. Visible Light Transmission: 64 %.
e. Visible Light Reflectance (Outside): 12%.
f. Visible Light Reflectance (Inside): 13%.
g. Total Solar Transmittance: 25%.
h. Total Solar Reflectance: 52%.
i. UV Transmittance: 6%.

3. Ceramic Frit: Opaque or transparent coating applied by roll or silkscreen process as necessary for required appearance; apply to heat treated substrate as recommended for the coating type and glazing assembly required.
4. Silicone Coated Spandrel Glass: Heat Strengthened or Fully Tempered per the coating manufacturer's recommendation for light size, configuration and assembly type required.

E. Laminated Architectural Flat Glass: Heat and pressure process to fuse glass to interlayer conforming to ASTM C 1172. Provide a minimum interlayer thickness of 0.060 inch; clear polyvinyl butyral (PVB) interlayer or clear ionic cross-linked thermoplastic ionomer as necessary for applications required.
1. Acoustic Glazing: As necessary for compliance with performance requirements for glazed acoustical assembly. At a minimum provide two lights for each glazing unit; one light having two layers of 0.1875 glass laminated together, and a second light having two layers of 0.125-inch-thick glass laminated together and assembled per IGU requirements.
2. Sloped Glazing: Two laminated panes each 0.25-inch clear tempered float.
3. UV Control Glazing: Filter out 99 percent of UV radiation below 380 nanometers (nm). Two panes each 0.25-inch clear float laminated to 0.030 thick clear UV absorbing interlayer (Monsanto Saflex).
4. Privacy Glass: Two sheets 7/32-inch Laminate high purity float glass with vision obscuring interlayer, Northwestern Industries, Inc. Sandwhite 0.030 LAM.
5. Translucent Glazing: Balanced assembly of two sheets of high purity float glass with vision obscuring interlayer, Northwestern Industries, Inc. White Diffuse 030 LAM, nominal 0.25 inch thick overall.
6. Laminated Safety Glazing: Comply with Performance Requirements.
7. Privacy Glass: Two sheets 0.25 inch thick, high-purity float, laminated with 0.060 white diffuse polyvinyl interlayer, Vanceva Arctic Snow, color code 0009. Comply with definition for safety glass in locations required.
8. Specialty Glass, Type GL-XX: Two panes of tempered clear float with custom graphics interlayer, overall thickness 0.5-inch-thick minimum.

F. Applied Privacy Glazing Film: Visible Light Transmittance 69 percent, shading Coefficient .82; CP Films, Llumar NRM PS2 Frosted.

G. Mirrors: Fabricate to sizes and configurations required to ASTM C1503 standard manufactured using copper-free, low-lead mirror coating process.
1. Annealed Monolithic Glass Mirrors: Mirror Select Quality, low-iron float glass with a minimum 91 percent visible light transmission.
2. Mirror M-1, Frameless type.
a. Size: As indicated in Drawings and shown in approved Shop Submittal, with radiused corners.
b. Nominal Thickness: 6.4 mm or unless otherwise indicated.
c. Edge: Beveled, unless indicated otherwise in Drawings

3. Mounting Hardware: J-Shaped Mirror Bar mounting channel: provide in single piece, continuous along bottom [bottom and top] of flat, polished-edge frameless mirror in [stainless steel] [polished chrome] [satin nickel] finish.

2.3 ACCESSORIES

A. Gaskets: Provide as necessary for glazed opening; black unless otherwise indicated
   1. Dense Compression Seal: ASTM C 864, neoprene, EPDM, or thermoplastic polyolefin rubber.
   2. Cellular Elastomeric Preformed: ASTM C 509, Type II, extruded or molded neoprene.

B. Glazing Tape: ASTM C 1281; preformed, closed cell, tape sealant recommended by manufacturers of tape and glass for each Project specific installation required.
   1. Fire Rated Glazing: Provide as necessary for compliance with Performance Requirements and UL assembly listing.

C. Cleaners, Primers and Sealers: Type recommended by manufacturer of gaskets, and tape.

D. Blocks and Spacers: Neoprene, EPDM or silicone as necessary for compatibility with glazing sealants.
   1. Hardness: 90 Shore A for setting blocks, and as recommended by glass and sealant manufacturers.

E. Filler Rods: Closed-cell synthetic rubber, or plastic foam, 25 percent compression at five to ten psi.

F. Sealants: Comply with Section 07 92 00 requirements for joint types required.
   1. Fire Rated Glazing: Provide type recommended by manufacturer and as necessary for compliance with UL assembly listing.

2.4 SOURCE QUALITY CONTROL

A. Glass Color Testing: Measure monolithic coated glass and coated insulting glass units.
   1. Color Target: Established per approved samples conforming to specified tolerance.
   2. Color Measurement: Calibrated, off-line spectrophotometer (Minolta 2500d / 2600d or equal); measure uncoated side of glass in the central area. Measure the first 15 panes/ units to establish the color target, then measure a minimum of 1 pane / unit every four (4) hours and each product change.
   3. Tolerances for color variation shall be less than 4.5 DE.
   4. Document and record result of each color measurement performed. Tag each pane / unit of glass that falls outside of the maximum color variation limits and certify that non-conforming glass will not be fabricated and or supplied to the Project.
   5. Perform on-line continuous color measurements.
   6. Perform quality control checks using off-line measurement instrumentation every 4 hours or product change.

B. Distortion Testing: Measure each pane of monolithic uncoated and coated heat-treated glass used in the Project.
   1. Measurement Device: LiteSentry measurement system, or equal.
   2. Horizontal Roll Wave: Millidopeter Criteria: (90% surface) Maximum + or – 120 A overall, or the highest overall measurement from the approved visual mock-up that is less than + or – 120 A overall, whichever is less.

3. Bow/Warp Tolerance: Tolerance as described herein.
4. Measure every hour on a vertical plane with an aluminum or other type of straight edge.
5. Documentation: Document and record results for each pane
   a. Tag each pane of glass that falls outside of the maximum distortion limits and certify that these non-conforming glass panes will not be fabricated and supplied to the Project.
   b. Provide written documentation of the Roll Wave and Millidopeter measurements of the glass used in visual mock-ups before the mock-ups are reviewed by the Owner and Architect for approval.
   c. Provide additional written documentation upon request by the Owner or Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect glass prior to and during installation; discard pieces with edge characteristics that could affect glass performance.

B. Examine frames to receive glazing for compliance with recommended tolerances, face and edge clearances, and general proper installation. Notify Contractor in writing of unacceptable conditions, and do not proceed with glazing where conditions have not been corrected.

3.2 INSTALLATION

A. Comply with FGMA Glazing Manual, and instructions of manufacturers of glass, and gaskets, to achieve air, and watertight performance.
   1. Provide safety glazing in individual lights, laminated and insulated glazing units per System Description requirements.

B. Prevent damage to glass edges during installation. Use rolling blocks, suction cups, wedges and other devices for proper handling of glass.

C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

D. Setting Blocks: Properly sized for glazing unit; locate at quarter points of unit width.

E. Cleaning: As recommended by glass fabricator and manufacturer. Wash both faces within four days of scheduled inspection intended to establish date of substantial completion.

F. Protect glass from contact with deleterious contaminants; immediately remove contaminants using method approved by glass manufacturer, and fabricator.

G. Glazing Film: Apply with continuous, permanent bond to glazing substrate; film shall be free of visual and surface imperfections and have a uniform appearance throughout the entire installation.

H. Installation Conditions: Some conditions of installation may represent a departure from conventional applications of certain glazing materials. Review each application and provide glass products and assemblies which are suited to the required use. Such applications may

include heat treatment of glazing to enhance strength, supplemental back-coating of spandrel glazing to ensure uniform opacity (eliminate pin holes and variations in coating density) and similar fabrication measures.

3.3 SCHEDULE OF GLAZING ASSEMBLY TYPES

A. Locations, Dimensions, and Quantities: As indicated for each type incorporating glass products specified.
   1. Type GL-1: One-inch Insulating Glass Unit:
      a. Exterior lite: 0.25-inch Vitro Clear glass with Vitro Solarban 70 on S#2, tempered where required.
      b. Air gap: 0.50-inch.
      c. Interior Lite: 0.25-inch Vitro Clear glass.
   2. Type GL-2: As GL-1 above, with ceramic frit on number three surface, tempered where required.
      a. Frit Pattern: As indicated on Drawings.
      b. Color 1: TBD.
      c. Provide blank margins where recommended for location of the coated surface in the glazing assembly Type.
   3. Type GL-3: Single glazed tempered in thickness required, not less than 0.5-inch.
   4. Type GL-4: Single glazed spandrel in thickness required, not less than 0.5-inch Opacifier or Glass pattern as indicated on Drawings.
   5. Type E: Sloped Glazing.
      a. Outboard Light: Tempered coated tinted float.
      b. Inboard Light: Laminated sloped glazing.
   6. Type M - Mirror (M1): Frameless. Reference 2.2.G. above.

END OF SECTION

SECTION 09 05 00 – MOISTURE CONTROL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for applied system to mitigate moisture levels and prevent adverse effect of elevated pH on applied finish floor covering for both new and existing Portland cement concrete slabs whether elevated or grade supported.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Review installation requirements for finish floor coverings and applied floor coatings; with the installers, identify criteria specific to each product and system for substrate acceptance relative to vapor emission and pH. Identify proposed mitigation measures will ensure acceptable conditions and moisture system compatibility with adhesives and coatings required for the Work.
   1. Provide coordination of Project conditions, work sequence and schedule and requirements for subsequent applied coatings and finishes.

1.3 SUBMITTALS

A. Provide complete data and application narrative for proprietary components.

B. Moisture Control System Narrative: Identify each component to be applied as work of this Section and basic function for each in mitigating conditions that may otherwise delay or prevent installation of subsequent work as required. Identify optional and accessory components to adapt a standard system to conditions anticipated to be encountered in the Work.

C. Quality Assurance Submittals: Demonstrate compliance with Preinstallation Conference requirements for verification of substrate conditions and materials compatibility.
   1. Manufacturer and Installer Certification that products provided as work of this Section are compatible with applied finish floor covering work of Division 9 Sections.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Specialist in application of moisture control systems similar to those required for the Work with specific experience with the manufacturer of the products to be used as work of this Section and as necessary to qualify for the required extended warranty.
   1. Written approved or similar documentation of applicator’s qualifications from the manufacturer of the moisture control system proposed for us as work of this Section.

B. Manufacturer's Field Quality Control Agent: Possess expert knowledge of the products being used including preparation, installation and warranty requirements. Shall have authority to certify that underlayment installation qualifies with the manufacturer's requirements for the application required.

C. Preparatory Testing of flooring Substrates: Technician current certification by International Concrete Repair Institute as a Concrete Slab Moisture Testing Technician and otherwise be familiar with testing methods and procedures for the work and fully capable of producing consistent and accurate test data with including but not limited to expertise in the following.
   1. ASTM F 1896 MVER moisture vapor emission rate.
   2. ASTM F 2170 rH of concrete substrates.
   3. ASTM F 2659 electronic moisture meter measurements.
   4. ASTM F 710 pH assessment of concrete substrate.
   5. ASTM F 2170 testing methodology and protocols.

1.5 SPECIAL WARRANTY

A. Manufacturer’s extended system warranty: guarantee moisture control system provided as work of this Section shall remain in compliance with Project requirements that finish floor coverings remain free of failure and defects due to vapor content, pH and related performance factors for a period of not less than five years following substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Moisture Control System: Subject to coordination and verification of compatibility with applied finish flooring work products of Ardex are the basis of design and shall establish minimum acceptable performance properties. Provide additional characteristics as necessary to conform to the Project schedule and accommodate Project specific conditions encountered in the course of the Work.

B. Basis of Design: ARDEX MC Ultra Moisture Control System.
   1. Primer: Ardex MC Ultra Primer with sand aggregate.
   2. Seal Coat: Ardex MC Ultra Sealer with sand aggregate.

C. ? Compatible with the finish floor covering and installation materials required. Subject to Contractor's determination of methods to be utilized and compatibility with flooring, acceptable vapor emission control coatings utilizing two-component 100 percent solids epoxy technology or other chemistry complying with STM F 3010 may include products of Ardex, Koster, Sinak, Floor Seal Technology or approved.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify substrate conditions; correct unacceptable conditions per the manufacturer's published procedures and field recommendations of manufacturer's field quality control agent and ensure compliance of completed work with extended warranty requirements of this Section.
   1. Substrate Joints and Cracks: Correct each category of joint and crack per manufacturer’s recommendations including but not limited to stable and active conditions, control joints, work stoppage joints and similar conditions that may adversely affect performance or durability of the Work.

B. Preparation and Testing of Floors: Remove incompatible coatings and surface irregularities. Patch and level substrate as necessary. Establish final surface that will ensure optimum and durable mechanical and adhesive bonds for flooring.
   1. Perform pH, bond and moisture tests per ASTM F 710 and ASTM F 2170 with a sampling not less than one for every 800 to 1,000 square feet of installation area and determine compliance of substrate conditions with the floor manufacturer's requirements.
   2. Concrete surfaces shall be primed and otherwise treated in accordance with the finish flooring manufacturer's recommendations for the installation required by the Contract Documents.

C. Substrate Moisture Content and pH Level: Contractor responsibility to ensure that moisture content and pH level of bonding substrate at the time the flooring installation is scheduled to occur complies with the manufacturer's acceptable moisture emission limits and pH for floor covering and adhesive required when evaluated per ASTM F 710 and ASTM F 2170 or limits. In no case shall a pH level greater than 9.0 be acceptable.

D. Vapor Emission Control and pH Control: Contractor shall determine most effective method or combination of methods to achieve the required installation conditions. Contractor shall be responsible to provide means and methods to effectively establish the moisture and pH levels required for the finish flooring in compliance with the Construction schedule and per the approved Vapor Emission Control Plan at no additional cost to the Owner.

3.2 INSTALLATION

A. Place moisture control system using the manufacturer’s recommended sequence and procedures; apply primer with broadcast application of sand aggregate followed by seal coat and additional broadcast sand aggregate. Comply with coverage rate recommended by the manufacturer and confirmed by the field quality control agent immediately prior to and during installation.
   1. Establish environmental conditions prior to installation and maintain during and following installation until material is sufficiently cured to be unaffected by conditions deviating from recommended limits. In no case shall conditions deviate from range of manufacturer’s intended normal service environment

B. Coordinate work of this Section with finish work products of Division 9 Sections for finish flooring and provide substrate conditions acceptable to finish flooring installer for each type of applied finish flooring required.

C. Work of this Section includes responsibility for ensuring that the moisture control system manufacturer's Field Quality Control Agent is present at the Project for the following milestones as a minimum.
   1. Required Site Visits: Pre-Installation Conference, review of field conditions, and as required by the manufacturer for extended warranty coverage.
   2. Manufacturer's agent shall also visit the site to review each stage of installation of the moisture control system.
   3. Visits shall be scheduled to afford comprehensive observation of the work while the work is actively in progress without prior notice to the installer.
   4. Site visit to inspect the completed work and certify the installation qualifies for the specified warranty.

END OF SECTION

SECTION 09 21 00 – GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for gypsum boards and accessories for drywall and other finish systems.

B. Related Sections:
1. Section 01 81 13.17 Sustainable Design Requirements - CALGreen
2. Section 09 21 16 Shaft Wall Assemblies.
3. Section 09 22 16 Non-Structural Metal Framing.
4. Section 09 51 00 Acoustical Ceilings.

C. Definitions: ASTM C 11.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Gren Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

C. Gypsum Association:
1. GA-214- Recommended Levels of Gypsum Board Finish.
2. GA-600- Gypsum Fire Resistance Design Manual.

D. Underwriters Laboratories, Inc (UL):
1. UL Fire-Resistance Directory.

E. ASTM International standards and testing procedures as listed in this Section.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data for cementitious materials, lath, metal support components, and accessories.

B. CALGreen Submittals: Product Data-VOC limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with limits specified.

C. Shop Drawings: Indicate movement joints in drywall assemblies, coordination with framing assemblies for vertical and horizontal assemblies and transitions between existing work to remain and new assemblies.

D. Samples: When directed provide one by one foot square incorporating one panel joint demonstrating finish texture required.

E. Closeout Submittals: Submit under provisions of Section 01 77 00.

1.4 QUALITY ASSURANCE

A. Fire-Resistance Assemblies: Tested per ASTM E 119 and UL listed, or other acceptable agency, for rating required.

B. Acoustic Performance: Assemblies tested per ASTM E 90 and classified per ASTM E 413.

C. Delivery, Storage and Handling: GA-216, GA-800.

D. Environmental Requirements: ASTM C 840; minimum ambient temperature between 55- and 85-degrees F., and as recommended by manufacturer.

E. Applicator Qualifications: Acceptable to manufacturer with documented experience on at least 5 projects of similar nature in the past 5 years.

F. Single Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

G. Single Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to the gypsum board manufacturer.

H. Mock-ups: Before beginning gypsum board installation, install mock-ups of at least 100 square feet in surface area to demonstrate aesthetic effects and set quality standards fo materials and execution.
   1. Install mock-ups for each level of gypsum board finish indicated for use in exposed locations.
   2. Apply final decoration indicated, including painting and wall coverings on exposed surfaces for review.
   3. Simulate finished lighting conditions for mock-up review.
   4. Subject to compliance with requirements, approved mock-ups may become part of the complete Work, if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENT–

A. VOC Limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 81 13.17.

B. Fire-Resistance Rated Assemblies: For fire-resistive rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing laboratory.
   1. Fire-Resistive Ratings: Indicated by design designations from UL Fire-Resistance Directory or GA-600 Gypsum Fire Resistance Design Manual.

C. STC-Rated Assemblies: For STC-rated Assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 MATERIALS

A. Gypsum Board: ASTM C 1396, products of a single manufacturer unless approved otherwise; products of different manufacturers shall be acceptable to the manufacturer of the gypsum board. Provide maximum lengths available to minimize end-to-end joints, 0.625-inch thickness is typical, provide other thickness where required.
   1. Provide the specific board Types for each application and as necessary for resistance to fire, moisture, impact and other conditions of service.
   2. Edges: Tapered, unless otherwise indicated, or acceptable.

B. Interior Gypsum Board: Mold-Resistant Type X and approved for vertical or horizontal application as required; USG, Georgia Pacific, CertainTeed or Temple-Inland except as otherwise specified for select locations. Provide additional types as necessary for specific performance requirements.
   1. Moisture Resistant Gypsum Board: ASTM D3273 mold growth resistance of 10 or better; moisture resistant non-cellulose facings having no special finish requirements and non-combustible, moisture and mold resistant gypsum core with tapered edges; GP DensArmour Plus Fireguard Interior Panel, CertainTeed ProRoc or USG Sheetrock Mold Tough Firecode X,
   2. Fire Rated Assemblies: Comply with UL Listed materials and tested assembly requirements for each assembly type required. At ceilings provide ASTM C 1396 Type X (special fire-resistant) panels as necessary for assembly compliance.
   3. Abuse Resistant Gypsum Board: Provide abuse resistant face and core at all corridors, stair walls, and public toilet rooms.

C. Interior Glass Fiber Mat Faced and Reinforced Gypsum Panels: ASTM C 1658, 0.625-inch-thick Type X panels, tapered edges; Georgia Pacific DensArmor Plus Fireguard, USG Sheetrock Glass-Mat Mold Tough Firecode X or approved.

D. Metal Framing Systems: Comply with requirements of Section 09 22 16 as necessary for framing assemblies required; size ceiling supports to comply with ASTM C 754 except as otherwise required.
   1. Non-perforated Gypsum Board Ceilings: Subject to compliance with Project requirements use of ASTM C 635 direct hung suspension system rated for heavy duty and drywall attachment clips complying with Section 09 51 00 requirements is acceptable.

E. Tile Wall Backing: ASTM C 1178 Inorganic matt reinforced gypsum panel with water-resistant treated core and factory applied heat cured acrylic face coating 0.5 inch and 0.625 thick as required; USG Durock Glass Mat Tile Backer, GP Gypsum DensShield Tile Guard, CertainTeed or approved.
   1. Fire Rated Assembly: Provide UL listed product in thickness necessary for assembly rating required.
   2. Fiber Cement Board: comply with Section 09 30 00.

F. Plywood Panels in Wall Assemblies: Reference Section 06 10 00.

2.3 ACCESSORIES

A. Accessories: ASTM C 1047; Standard types as required; galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound, and one-piece control joint beads.

B. Joint Tape, and Compound: ASTM C 475; type recommended by the manufacturer for the application indicated unless otherwise required.
   1. Joint Compound: Ready-mixed vinyl-type for interior use; chemical hardening type for exterior; water resistant type for water resistant backer board and panel in wet-use areas.

C. Anchors and Adhesive:
   1. Adhesive: Recommended by gypsum board manufacturer and complying with VOC limitations. Adhesive for Wood: ASTM C 557.
   2. Nails for Wood: ASTM C 514.
   3. Screws for Metal Framing: 20 Gage and lighter ASTM C 1002, minimum 1.25 inch long, Phillips-head, Type S;18 Gage and heavier ASTM C 954

D. Provide auxiliary materials of the type and grade recommended by the manufacturer of the gypsum board.
   1. Acoustical Sealant: Per Section 07 92 00.
   2. Thermal and Acoustic Insulation: As required in Section 09 81 00.
   3. Ceramic Tile Backing Panels: Provide tape, joint compound, and other accessories as recommended by the panel manufacturer for the Project specific assembly required.
   4. Epoxy Painted Panels: Waterproof skim coat.
   5. Acoustic Sleeve: Size and configure for each penetration from 22 gage galvanized steel, fabricate flange to extend a minimum of 1.5 inch onto face of gypsum board.

E. Edge Trim Reveals: Extruded aluminum with clear anodized finish; products of Fry Reglet, provide standard U and L type trim for finishing panels edges and as otherwise required. Plastic and vinyl trim, edge and corner bead products are not allowed.
   1. Edge Trim Type A 0.625 inch by 0.5 Z shape.
   2. Edge Trim Type B 0.625 inch by 0.25-inch Z shape.

F. Sound Barrier Mullion Trim Cap: Provide pre-finished 0.125-inch extruded aluminum trim cap in profile indicated and in lengths required; provide concealed attachment to partition framing and compressible gasket at existing glazing system as required to satisfy performance requirements. Subject to performance requirements, provide products by Mull-it-Over Products, Mullion trim Cap, or Gordon Architectural, Mullion Mate.
   1. Profile: As selected by Architect to allow solid attachment and fastening to the partition wall framing.
   2. Color and Finish: As selected by Architect, standard anodized or custom color options.
   3. Acoustical performance: STC 55, minimum.
   4. Provide and install accessory products to manufacturer’s requirements, including fasteners, ASTM E 84 Class 1, microbial growth-resistant, sound absorbing foam and sealants.

G. Acoustic Accessories: Provide the following as necessary for isolation and support of acoustic assemblies; include fasteners, pads and gaskets as necessary for required performance.
   1. Sway Braces: Interlocking steel clips with neoprene isolation pad, nominal dimensions 3.75 inches tall by 1.5 inches wide and as required for differing assembly types; WIC-2 by Mason Industries.
   2. Mineral Fiber Panels: Reference Section 09 81 00.
   3. Fiber Glass Batt: Reference Section 09 81 00.
   4. Acoustic Gasket: 0.3125 inch thick, 40 Durometer, neoprene waffle; Mason Type W, Kinetic NP/NG or approved.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Metal Framing: Comply with requirements of Section 09 22 16.
   1. Steel Fire Door Frames: Comply with Project requirements, and GA-219.
   2. Coordinate with Section 07 21 00 and Section 09 81 00 requirements for insulated assemblies.
   3. Backing and Reinforcing: Verify assemblies have been reinforced for mounting of wall and ceiling supported components per Section 05 40 00 or 09 21 00 requirements.
   4. Ceilings: Coordinate with Section 09 51 00 for work supported by suspended acoustical ceiling grid assemblies.

B. Gypsum Board: ASTM C 840, GA201 and GA 216; Face side out, joints tightly butted, plumb, level and square; shim as necessary to maintain required tolerances. Do not use damaged boards. Cover both faces of partition frame including concealed spaces, except in reinforced chase walls. In concealed areas scraps 8 square feet and larger may be used, unless otherwise necessary for performance requirements.
   1. Fire Rated Assemblies: Comply with requirements of UL Listed and tested assembly types indicated; provide materials and installation as required for the approved Listed assembly. Coordinate with Section 07 84 00 requirements for perimeter and penetration seals.
   2. Mold Resistant Panels: Provide throughout for interior applications, ceilings and walls including accessory components.

C. End Joints: Minimum number possible, locate exposed joints away from center of walls and ceilings; stagger not-less-than one foot in alternate courses. Install wall and partition boards with long edges vertical; stairwells, and high walls with long edge horizontal, and end joints staggered over supports, unless otherwise acceptable.

D. Locate edge or end joint over supports; stagger vertical joints over different studs on opposite faces of partitions. Attach gypsum board to supplementary framing and blocking; provide supplementary support at corners, openings, cutouts, and penetrations. Reinforcing may be omitted where control joints are required.
   1. Abut like edges; tapered edges against tapered edges and cut ends against cut ends. Do not place tapered edges against cut edges or ends.

E. Control and Expansion Joints: As minimum comply with ASTM C 840 and GA 216 recommendations for control joints, obtain Architect approval of location of joints not shown on drawings; form with space between edges of boards prepared to receive trim accessories.
   1. At door jambs where rough opening is framed with 0.5-inch gap between jack and bearing stud and where partial height door frame falls at a location where a control joint is required by refenced standard; extend joint to top of partition from both corners.
   2. Ceiling area 2,500 square feet and greater, joint spacing not great than 30 feet with no perimeter relief and 50 feet with perimeter relief.

F. Isolate perimeter of non-load-bearing drywall partitions at structural abutments; provide 0.25-to-0.5-inch space, trim edge with U-type edge trim, and seal joint with acoustical sealant.

G. Insulation: As indicated; install full height of partition, tight to framing and penetrations unless otherwise required.
   1. Acoustic: Install prior to gypsum board unless readily installed after board has been installed; provide at sound-rated assemblies, and location indicated.

2. Thermal: Install vertically; hold in place with z-furring placed 24 inches on center, use 18 gage staples through slots in furring web to hold in place until board is install; provide at locations indicated.

H. Single-Layer Application: Screw to metal supports; screw or nail, and glue to wood.
1. Ceilings: Apply board prior to application to wall and partition to the greatest extent possible.
2. Long edges horizontal on partitions and walls 8 feet one inch and less in height; use maximum length sheets to minimize end joints.
3. Z-Furring: Long edges vertical, supported by furring; no end joints.

I. Double-Layer Application: Gypsum backing board base, and gypsum wallboard face layer; stagger joints between layers at least ten inches. Fasten base layer with screws and face layer with adhesive and screws.
1. Ceilings: Apply base prior to application of wall and partition base; apply face layers in same sequence. Apply base layers at right angles to supports unless otherwise indicated.
2. Z-Furring: Base layer, long edges vertical, locate on furring member; face layer long edges vertical or horizontal; offset vertical joints at least one furring member.

J. Trim and Accessories: Provide edge trim, and corner beads on exposed edges of gypsum base; types indicated, and as required. Fasten to substrate as recommended by manufacturer; where feasible, use same fasteners required for gypsum board, otherwise, nail or staple.
1. Embed face flange in joint compound; L-type trim where work is tightly abutted to other work; kerf-type where work is kerfed to receive long leg of L-type trim; U-type where edge is exposed, revealed, gasketed, or sealant-filled.

3.2 SPECIAL INSTALLATIONS

A. Acoustically Insulated Work: Double-layer work on resilient furring, unless otherwise indicated; seal perimeter, joints, openings, and penetrations with a continuous bead of acoustical sealant on both faces of partition.
1. Comply with ASTM C 919 and manufacturer's recommendations for location of beads.
2. Close off sound-flanking paths around or through the work, including sealing of partitions above acoustical ceilings.
3. Multi-layer Assemblies: Tape and finish joints in each layer.
4. Penetrations: Oversize to allow a minimum annular gap of 0.75 inch for entire perimeter. Isolate penetrant from wall assembly. Provide sheet metal sleeve bedded in sealant and fill annular gap with acoustic insulation (regardless of whether penetrant is insulated). Comply with Section 07 92 00 requirements for seals.
5. Fill voids at junction boxes and similar components in assembly cavity with acoustic insulation.

B. Direct-Bonding Substrate: Concrete or masonry as indicated, comply with manufacturer's recommendations, brace board until adhesive has set.

C. Gypsum Board Scheduled to Receive Epoxy Paint: Moisture resistant gypsum board at walls; ceilings shall comply with requirements for tile wall backing. Seal ends, cut edges and penetrations with water-resistant adhesive or, water-resistant joint compound as recommended by backing board manufacturer.

D. Tile Wall Backing: Coordinate panel thickness with abutting assemblies to ensure smooth and flush transition at finish walls.
   1. Provide acceptable substrate ready for required tile installation. Coordinate installation with Section 09 30 00 requirements and comply with TCA Handbook method W245.
   2. Tape and finish joints to prevent absorption and penetration of water through the assembly and comply with recommendations of gypsum backing board manufacturer for additional joint treatment.

E. Gypsum Board Shaft walls: See Section 09 21 16 for additional requirements.

3.3 FINISHING

A. Fill and prepare butt-joints, edges, accessory flanges, penetrations, fastener heads, surface defects, and as necessary for final finish; prefill open joints and rounded or beveled edges. Tape joints between gypsum boards, except where trim accessories are indicated.
   1. Apply joint compound in 3 coats; omit third coat on concealed work.
   2. Multi-layer Assemblies: Tape and finish joints in each layer.

B. Provide GA-216 Level 5 finish for all public areas, interior glass mat faced panels and walls scheduled to receive epoxy paint; Level 4 finish for all non-public areas.

C. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall work being without damage or deterioration at time of substantial completion.

3.4 TOLERANCES

A. Exposed joints, including control joints and sealant joints at openings: Straight, plum and regular. Limit variation in width to 1/8-inch total in 10 feet; variation from plumb 0.125 inch in 8 feet; variation from location indicated plus or minus 0.125 inch.
   1. Unless otherwise required, dap unexposed face of boards to accommodate mounting hardware, brackets and other miscellaneous work as necessary to maintain tolerances.

B. Variation of board surface from plum and level: Plus or minus 0.25 inch in any 4 foot by 8 foot panel or section.

C. Work that does not conform to specified tolerances may be rejected; replace or correct as acceptable.

END OF SECTION

SECTION 09 21 16 – SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for products, equipment, labor, and services necessary and required for gypsum board shaft wall assemblies to enclose vertical shafts, stairs, chases and others required.
   1. Definitions: Gypsum Association GA-505.

B. Related Sections:
   1. Section 01 81 13.17 Sustainable Design Requirements – CALGreen.
   2. Section 09 21 00 Gypsum Board.
   3. Section 09 22 16 Non-Structural Metal Framing.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Gren Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

C. Gypsum Association:
   1. GA-214- Recommended Levels of Gypsum Board Finish.
   2. GA-600- Gypsum Fire Resistance Design Manual.

D. Underwriters Laboratories, Inc (UL):
   1. UL Fire-Resistance Directory.

E. ASTM International standards and testing procedures as listed in this Section.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data for metal support components, and accessories.

B. CALGreen Submittals: Product Data-VOC limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with limits specified.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Specially shaped frame of metal studs, tracks, and accessories to receive gypsum boards, to provide a complete assembly erected entirely from room-side of

shaft, except for finish layer on shaft-side, where required. Modify manufacturer's recommended system to comply with Project requirements, and governing regulations.

1. Room-Side Finish: As indicated, use Type X gypsum boards.

B. Performance Requirements: Shaft wall assembly complying with the following.

1. Fire-Resistive Assemblies: GA-600; UL Tested and listed, or other acceptable agency, for rating required.
2. Lateral Load: As necessary to support elevator rail and carloads applied transiently and cyclically for maximum partitions height required and to resist seismic load requirements.
3. Deflection Limit: l/240.
4. Sound Transmission Class: ASTM E 90 STC 35.
5. VOC Limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 81 13.17.

2.2 MANUFACTURER

A. Subject to compliance with requirements, provide products of one of the following: Georgia Pacific, United States Gypsum or CertainTeed.

B. Obtain gypsum board products from a single manufacturer to the greatest extent possible, products of other manufacturers: acceptable to manufacturer of gypsum board.

2.3 MATERIALS

A. Steel Sheet: ASTM A 653, Grade 33, coating designation G60 galvanized, or ASTM A 463, T1 40 aluminized.

B. Gypsum Board Shaftliner: ASTM C 1396; Comply with requirements herein and with Section 09 21 00.

1. Type X, moisture-resistant paper facings, in maximum lengths available, and thickness indicated; minimize end-butt joints; except where shaftwalls are erected in advance of positive building enclosure provide ASTM C 1658 water-resistant Type X panel.
2. Shaftwall Board Thickness: As indicated, but not less than 0.75 inch.

C. Metal Framing: Fabricated of steel sheet, comply with requirements of AISI Specification for Design of Cold-Formed Steel Structural Members and ASTM C 645. Provide component types, and profiles necessary for each assembly required for the Work to comply with Performance Requirements.

1. Gage: As indicated, but not less than 21, provide component shapes and sizes as necessary, and required.

D. Provide trim accessories, joint treatment materials, adhesives, sealants, and auxiliary materials as required in Section 09 21 00.

1. Provide acoustic insulation as indicated and required for STC.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Coordinate work with sprayed-on fireproofing. Do not reduce fire-resistance rating of fireproofing. Repair or replace sprayed-on fireproofing removed or damaged during the installation of the shaft system as acceptable to the Architect.

B. Comply with Project requirements, Section 09 22 16 and 09 21 00, ASTM C 754 and manufacturer recommendations for installation of metal framing and gypsum boards.
   1. Anchor and fasten materials and components to comply with ratings and performance requirements, and to comply with governing regulations.

C. Install supplementary framing, blocking, and bracing to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum drywall shaft system.
   1. Isolate shaft system from transfer of structural loading to system, both horizontally and vertically.

D. Seal joints, penetrations, and perimeter of shaft wall where it abuts other work. Provide two beads of acoustic sealant at perimeter installed so as to prevent its dislocation by air pressure differential between shaft and external spaces.

E. Finish: As indicated and required in related sections.
   1. Painting: As scheduled, and as required in Section 09 91 23.

F. Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures drywall shaft system work being without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 09 22 00 - ACOUSTICAL PLASTER

PART 1 - GENERAL

1.1 SUMMARY

Section includes requirements for acoustical plaster work.

A. Submittals:
   1. Product Data: Submit manufacturer's product data for cementitious and acoustic materials, and each accessory component or product necessary for the installation required.
   2. Samples: Two by two feet, complete acoustic plaster assembly on substrate required for the Project. Provide finish and texture to be expected in the final work.
   3. Shop Drawings, indicating control joint locations.

B. Environmental Requirements: ASTM C 843; recommendation of plaster manufacturer and as required.
   1. Maintain continuous uniform temperature between 55 and 70 degrees F for one week prior to and during installation of plaster, and until plaster is fully cured but not less than one week after application is complete. Ensure uniform temperature and prevent damage to plaster due to temperature extremes and fluctuations.
   2. Ventilation: Remove water in excess of that required for hydration of plaster following application and unit plaster is set.

C. Warranty: Provide labor and material warranty agreeing to provide replacement material and labor to correct acoustical plaster work that fails to remain in compliance with Project requirements, including but not limited to acoustical performance for a period of 5 years.

D. Job Site Mock-Up: Install 4’ x 4’ mock-up replicating relative details and conditions.
   1. Obtain mock-up acceptance before any additional applications.
   2. Accomplish work to equal or exceed standard established by accepted job site mock-up.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, basis of design is StarSilent products of Pyrok Inc.
   1. Acoustical Plaster Materials: Products of a single manufacturer, products not manufactured by them shall be approved by them and included in the specified warranty. Subject to compliance with requirements, alternate manufacturers offering comparable products are BASWA Phon Acoustic Plaster, Feller Even Better Designer Ceilings 1.5,” or as approved by Architect.

2.2 PRODUCTS

1. Acoustical Plaster: Manufacturer’s proprietary base and finish materials for two-part plaster system applied to crush glass backing board. Provide Smooth plaster finish

over 25 mm StarSilent Panel substrate. The completed assembly shall have the following performance characteristics.

2. Flame Spread and Smoke Development: ASTM E 84, Class A.
3. Sound Absorption: ASTM C 423 NRC not less than 0.70.
4. Sound Transmission Class: ASTM E 90; STC 30.

B. Accessories: ASTM C 1047, and types indicated, formed of galvanized steel with flanges for concealment in veneer plaster, except where semi-finishing type required.

C. Framing: Components: Comply with System Description and all other requirements of Section 09 22 16 for member shapes and sizes necessary for the manufacturer's engineered assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Coordinate installation with supporting structure, and other building systems behind acoustical plaster assembly as necessary to provide required support for plaster and accommodate building systems.

3.2 INSTALLATION

A. Metal Support Systems: Comply with Section 09 22 16 requirements and provide stable support for acoustical plaster work of this Section for assembly types and configurations required.

B. Control Joints: Provide at joints in supporting structure and locations per manufacturer's system requirements.

C. Crushed Glass Base Panel: Mechanically attach to furring framework per manufacturer's engineered assembly.

D. Provide accessory components as necessary for finishing of edges, terminations and penetrations. Fasten to substrate as recommended by manufacturer; and as required for base panel.

1. Embed face flanges in plaster, and as otherwise required for profile and conditions of installation.

E. Color: Provide integral color to match Architect’s sample.approved. Where color match or color consistency is unavailable or unsupported by manufacturer, reference Section 09 91 23 for painting requirements.

F. Comply with manufacturer's recommended procedures and applicable provisions of ASTM C 843. Apply acoustical plaster work to provide seamless installation with uniform texture and appearance.

1. Repair damage and deteriorated veneer plaster surfaces regardless of whether damage occurred prior to start of the Work or in conjunction with it.
2. Two Coat Work: Apply and cure base and finish coats sequentially in accordance with manufacturer’s recommendations.

END OF SECTION

SECTION 09 22 16 – NONSTRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for light gage metal framing, and related accessories to support plaster, drywall, and assemblies indicated.

B. Related Sections:
1. Section 09 21 00 Gypsum Board.
2. Section 09 21 16 Shaftwall Assemblies.

1.2 SUBMITTALS

A. Product Data for metal support components, and accessories.
1. Structural Characteristics: For anchors, pre-engineered support components and assemblies provide ICC-ES Report and other documentation satisfactory to Authority having jurisdiction over the Work.

B. Shop Drawings: To the extent not documented by product data submittals for Project specific installations provide details including anchors for each assembly type proposed for use in the Work. Document Contractor designed seismic loading resistance, including resolution of conflicts between building system assemblies and ceiling suspension.
1. Provide drawings and calculations sealed by Registered Engineer for Contractor designed support systems and anchors not having an ICC-ES Report and applications not complying with ICC-ES criteria.

C. Coordination Drawing: Provide as necessary for coordination of ceiling supports with construction in the ceiling plenum and where other work may affect metal framing systems work of this Section.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Metal Support System: Subject to Project requirements, provide products by a member company of the Steel Stud Manufacturers Association, including but not limited to: Dietrich Industries, SCAFCO Corporation and Steeler Incorporated.

B. Direct Suspension System: Subject to Project requirements, provide products of one of the following manufacturers: Chicago Metallic Corp., Donn Corporation. and United States Gypsum Co.

2.2 SYSTEM DESCRIPTION

A. Design Requirements: AISI Specifications for Cold Formed Steel Structural Members and Project requirements.

1. Suspension System: International Building Code with State amendments Section 803 and Chapter 16, and ASTM C 635.
2. Coordination of Ceiling Suspension Support with Building Structure and Other Building Systems: Where direct anchorage to building structure is impractical due to dimensional restriction, conflict with HVAC, plumbing, electrical or other considerations provide fully engineered design for ceiling support assembly. Coordinate with HVAC, Plumbing, electrical fire protection and all other building systems to identify potential areas of conflict for ceiling anchorage and prepare engineered solution in advance of installation.
   a. Do not attach metal support systems to plenum construction.

B. Performance Requirements:
1. Fire Rated Installations: ASTM E 119 tested, UL listed assemblies for rating required.
2. Structural Criteria: Assemblies not conforming to the manufacturer's ICC-ES documentation shall be designed by the Contractor's Professional engineer to comply with seismic criteria in the General Structural Notes on S series drawings and ICC Section 1607.14 and Section 1613 requirements.
3. Material yield stress and member structural properties are minimum required, increase material thickness and yield strength for member size, spacing and span required to limit deflection due to Code required loads to L/360 of span.

2.3 MATERIALS

A. Studs, Runners, Track and Channels: ASTM C 645, ASTM A 653 G 60 galvanized; size and material thickness required.
1. Support System for Screw Attached Gypsum: ASTM C 754.
2. Accessories: Manufacturers standard as necessary for a complete installation.

B. Deflection Track: Accommodate a minimum of 1-inch vertical movement and be UL listed for use in one- and two-hour fire resistive assemblies as required.

C. Flexible Track for Radius Assemblies: 20 gage, 2.5, 3.625 and 6-inch depths as necessary for wall types required; Contour Track by Dietrich Industries.

D. Furring: ASTM A 653, G60 galvanized, and ASTM C 645, Size components to comply with ASTM C 754 and for installation required.
1. Channels and Braces: Cold-rolled steel.
2. Hat-Shaped and Z-Furring: For mechanical attachment.
3. Studs: Cee-shaped.
4. Brackets: Corrugated edges; length adjustable to 2.25 in.
5. Anchors: Wire ties, clips bolts and screws complying with Project requirements, and as recommended by manufacturer.

E. Fasteners and Anchors: ASTM C 754, galvanized; Type and size required, and recommended by manufacturer for substrate and application indicated. Attach similar components by welding; weld or mechanically attach dissimilar components as recommended by manufacturer.
1. Screws: ASTM C 1002
2. Wire: ASTM A 641, 16 Gage.
3. Welds: Comply with AWS recommendations.

F. Gaskets and Closures: Permanently resilient, non-bleeding and inert. Closed-cell neoprene, or other acceptable material. Provide as necessary for acoustic privacy and other

performance characteristics. Fire rated assemblies shall comply with Section 07840 and UL listing requirements.

1. Sill Seal: Foam gasket and self-adhering membrane: Triple Guard Energy Sill Sealer by Protecto Wrap or approved.

G. Acoustic Accessories: Provide the following as necessary for isolation and support of acoustic assemblies; include fasteners, pads and gaskets as necessary for required performance.

1. Sway Braces: Interlocking steel clips with neoprene isolation pad, nominal dimensions 3.75 inches tall by 1.5 inches wide and as required for differing assembly types; WIC-2 by Mason Industries.
2. Mineral Fiber Panels: Inorganic mineral fiber board; Micore Brand 160 by USG.
3. Fiber Glass Batt: ASTM C 553, Type I, R-value of 11, for 3.5-inch thickness, flame spread 25, smoke developed 50.
4. Acoustic Gasket: 0.3125 inch thick, 40 Durometer, neoprene waffle; Mason Type W, Kinetic NP/NG, or approved.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate installation with supporting structure, inserts, imbeds, anchors, supplementary framing, and blocking to develop full strength of metal framing system, and comply with Project requirements.

1. Furnish inserts and imbeds to other trades for installations well in advance of time needed for coordination with other work.
2. Coordinate attachments for metal support systems with spray applied fireproofing.

3.2 INSTALLATION

A. Metal Framing Systems: Provide framing components for assemblies subject to imposed loads as work of Section 05 40 00 and this Section as indicated and as necessary to comply with Project requirements including but not limited to member size, and gage for span and spacing required.

B. Component Size and Spacing: Indicated and as required by reference standards; attach to supporting structure by welding, and mechanical joining as indicated and acceptable.

1. For Screw Attached Gypsum: ASTM C 754.
2. Lath and Furring: ASTM C 841, and Steel Stud Manufacturers' Association recommendations; do not attach hangers to metal deck tabs.
3. Coordinate with Section 09 21 16 and Section 09 81 00 requirements for acoustically insulated assemblies. Frame double stud acoustic walls so that nothing bridges the gap between each row of studs, and off-set studs in each row a minimum of 10 inches. Coordinate framing to ensure isolation of partition assembly and that required acoustic performance is achieved.
4. Sill Gaskets: Provide two contiguous lines of specified product at sills of walls and seal against air intrusion and sound transmission. Comply with Section 07 84 00 requirements at fire rated assemblies.

C. Provide supplementary framing, blocking and bracing at terminations, and openings in the work, and for support of wall-hung shelving, cabinets, fixtures, equipment, heavy trim, grab

bars, toilet accessories, furnishings, surface mounted hardware and similar work as necessary.

1. 600 S 162-54 track at 24, 48 and 72 inches AFF unless otherwise indicated. Trim flanges to fit at studs.
2. Grab bars and other barrier free access assistive components, provide reinforcing to resist concentrated load of 250 pounds and as necessary for compliance with regulatory requirements.

D. Isolate system to prevent transfer of loads from structure. Provide flexible joints to absorb loads, and movement, but maintain lateral support.
   1. Provide deflection heads at tracks attached to structural deck.
   2. Coordinate with Section 09 83 13 requirements for acoustically insulated assemblies.

E. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated. Frame both sides of control joints.

F. Sub-structure to Support Ceiling and Wall Systems: As indicated for ceiling assemblies in Architectural details and elsewhere. Coordinate the assembly with building systems including but not limited to HVAC, plumbing, fire protection and electrical systems. Provide for support of suspension grid required for lay-in panel work of Section 09 51 00 and direct attachment of ceiling assembly for work of Section 09 54 34.
   1. MDO Panels: Coordinate with work of Section 06 40 00.

3.3 VERTICAL SUPPORT SYSTEMS

A. Provide tracks at floors, ceiling, and structure where system abuts other work, unless otherwise required. Extend and attach support systems to primary building structure unless otherwise indicated; provide foam gasket on runner when system terminates at suspended ceiling.

B. Framing For Doors and Openings: Unless otherwise indicated; Double studs face-to-face at jambs and one stud not more than 6 inches from jamb; screw frame and jamb anchors directly to jamb studs.
   1. Jamb Studs: 0.0346 inch thick for openings up to 42 inches wide and 0.0451 inch thick for openings 42 inches and wider.
   2. Provide track section for jack studs at head and secure to jamb studs, do not bridge control joints.
   3. Provide framing beneath sills as required for heads.

3.4 HORIZONTAL SYSTEMS

A. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to inserts, clips or other anchorage devices or fasteners as indicated.

B. Provide framing components for ceiling types and configuration indicated. Coordinate with details indicated.

C. Coordinate with assemblies in ceiling plenum and minimize potential for conflicts with ceiling supports. Modify ceiling supports to accommodate work in the ceiling plenum, provide supplemental suspension members and hangers as necessary to comply with System Description requirements.

1. Attach metal supports to structure and anchors of type and size suitable for substrate and imposed loads per approved submittals.

3.5 TOLERANCES

A. Horizontal and Vertical Work: 0.125-inch total in twelve feet for plumb; shim members as necessary to accommodate irregular substrate and structure. 0.25-inch total in ten feet for parallel and perpendicular walls; 0.5 inch for location. Level main runners to 0.25-inch total in twelve feet measured lengthwise on each runner and transversely between runners.

END OF SECTION

SECTION 09 24 00 – PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Work includes all labor, materials, and equipment necessary to install all aspects of a Portland Cement Plaster assembly on metal lath and solid bases.

B. Related Sections:
1. 06 10 00 – Rough Carpentry.
2. 07 25 13 – Weather Resistive Air Barriers.
3. 07 62 00 – Flashing and Sheet Metal Work.
4. 07 92 00 – Joint Sealants.
5. 09 91 13 – Exterior Painting.

1.2 REFERENCES

A ASTM C 150 - Standard Specification for Portland Cement.

B ASTM C 206 - Standard Specification for Finishing Hydrated Lime.

C ASTM C 926 - Standard Specification for Application of Portland Cement-Based Plaster.

D ASTM C 932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.

E ASTM C 1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.

F ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

G California Building Code (CBC), ICC (IBC) - International Building Code; with California Amendments.

H Gypsum Association—Fire Resistance Design Manual GA-600, 2009

I. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc..

J PCA EB049 - Portland Cement Plaster/Stucco Manual; Portland Cement Association.

K UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc..

L Manufacturer's specifications and recommendations.

M NAAMM – ML/SFA 920 Guide Specification for Metal Lathing and Furring.

1.3 ASSEMBLY DESCRIPTION

A. General: Portland cement plaster is comprised of a water-resistive barrier, optional sheathing, lath, scratch, brown coats, and a finish coat. Minimum nominal ¾ inch cement thickness.

B. Application Methods: The plaster may be applied by hand tools or machine pumps but must have sufficient force to adhere to the substrate.

C. Framing shall have a deflection of L/360 or stiffer.

D. Fire Rated assemblies shall be per the test report or special instructions.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Demonstrate compliance with specified attributes. Include mix design for each coat.

B. Shop Drawings: Show location, installation and type, fully dimensioned, of all control joints, expansion joints, embedments, inserts penetrations and any other items that will visually affect the plaster surface for all visible portions of the plaster surfaces.
   1. Include plans, elevations, sections, details of components, and attachments to other work.

C. Samples for Selection: For each type of factory-prepared finish coat indicated.

D. Samples for Verification: For each type of colored finish coat indicated; 18 by 18 inches and prepared on rigid backing.

E. VOC Submittals:
   1. Product Data – VOC Limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in related section.

1.5 PRE-INSTALLATION MEETINGS

A. Preinstallation Conference:
   1. Conduct conference at Project Site prior to the installation of any plaster cladding, including mock-ups.
   2. Attendees shall include Architect, General Contractor, Applicator of the system and the Technical Consultant, supplied by the local distributor.

1.6 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer: All component materials shall be SMA approved and shall be distributed by authorized dealers.
2. Plastering Contractor:
a. Shall specialize in lath and plaster contracting, document experience of at least 5 years, and follow SMA published recommendations or provide certificates to demonstrate stucco knowledge.
b. Provide proof of current contractor's license and bond where required.

B. Installed materials shall be acceptable to the Authority Having Jurisdiction. Comply with the latest editions of the standards referenced in this section, except where more stringent standards are specified or required by the manufacturer.

C. Perform work in accordance with PCA Portland Cement Plaster (Stucco) Manual and ASTM C 926.
1. Maintain one copy of each document on site.

D. Regulatory requirements: All plaster work shall be performed in accordance with requirements of California Building Code, Chapter 25.

E. Fire-Resistance Ratings: Where indicated, provide Portland Cement Plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.7 MOCK-UPS

A. Prior to the installation of the plaster system work, provide a mock-up panel to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Panel must be constructed as per the Architect's size and dimension requirements, and minimum of 8 feet long by eight feet wide using materials specified for final work.
2. Panel must demonstrate the proposed range of color, texture and workmanship to be expected in the completed work,
3. Show a cut-away in the panel exposing the water resistive barrier, metal lath and drainage weep of the system on a perimeter edge of the panel.
4. Obtain Architect's acceptance of the visual qualities of the sample panel.

B. Mock-up Panel: See Drawings for mock-up placement, whether free-standing or constructed in place on building exterior.
1. Incorporate finish and terminations adjacent to material used in Project.
2. Include plaster returns at corner and required extruded aluminum accessory trim components.
3. Provide separate areas for each color and finish.
4. Construct additional panels until finish, color and consistency is approved by Architect.
5. Maintain sample panel throughout the construction process and dispose of when project is completed.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver all materials to the construction site in their original, unopened packaging with labels intact.

B. Inspection: Inspect the materials upon delivery to assure that specified products have been received. Report defects or discrepancies to the responsible party according to the construction documents; do not use reported material for application.

C. Storage: Store all products per manufacturer's recommendations. Generally, store materials in a cool, dry location; away from direct contact with the ground and/or concrete; out of direct sunlight; and protect from weather and other damage.

1.9 PROJECT CONDITIONS

A. Environmental Requirements: Follow product manufacturer's recommendations for environmental conditions and surface preparation.
   1. Temperatures: Before, during and following the application of the Portland Cement Plaster, the ambient and surface temperatures must remain above 40 degrees F for a minimum period of 24 hours. Protect stucco from uneven and excessive evaporation, especially during hot, dry and/or windy weather. Protect the Portland Cement Plaster from freezing for a period of not less than 24-hours after set has occurred.
   2. Substrates: Prior to installation, inspect the wall for surface contamination or other defects that may adversely affect the performance of the materials, and shall be free of residual moisture. Do not apply the Portland Cement Plaster to substrates whose temperature are less than 40 degrees F or contain frost or ice.
      a. All wood-based products covered shall be dry and have a moisture content below 19%.
      b. Allow cast-in-place concrete to cure to fully cure at a minimum of 28 days prior to applying base coat or accessories.
   3. Inclement Weather: Protect applied material from deleterious effects until cured or dry.

B. Existing Conditions:
   1. Contractor shall walk the project prior to starting work and notify the architect or owner's representative of any deficiencies that will negatively impact the plaster assembly. Do not proceed until remedied.
   2. Contractor shall advise architect of any horizontal surfaces with inadequate slope.

C. Protection:
   1. Cover building openings in areas adjacent to plastering work with plastic film.
   2. Protect finish surfaces installed prior to plastering by covering with a suitable non-staining material. Cover metal frames with plastic film.
   3. Maintain protection in place until plaster work is complete.

D. Conduct a field review of control joints and reveal placement with Architect for approval prior to scratch coat application.

1.10 SEQUENCING AND SCHEDULING

A. Sequencing: Coordinate the installation of the lath and Portland cement plaster with all other construction trades. To reduce stucco cracking, apply plaster only after the building is 90 percent dead loaded and the interior gypsum has been installed.

B. Plastering contractor shall request and attend a pre-installation meeting with general contractor and architect prior to the framing being completed. Plastering contractor shall advise architect of control/expansion joint layout concerns. There shall be no cost to the owner for moving one-piece control joints prior and up to this meeting date, additional lineal footage of control joints from plans shall warrant a change order.

1.11 WARRANTY

A. Special Warranty: Submit documentation on all products. At completion of work, contractor shall provide a written warranty documentation for the assembly and products used in which the manufacturer agrees to repair or replace Portland cement plaster system failure, including materials and workmanship, within the specified warranty period forthe following:
1. Adhesive or cohesive failures.
2. Surface crazing or spalling.
3. Abrasion or tearing.
4. Coating deterioration beyond normal weathering.
5. Manufacturing defects.
6. Structural failures including cracking in excess of 3/32 -inch or by PCA standards.
7. Shrinkage.

B. Warranty Length: Eight years commencing at Substantial Completion.

1.12 MAINTENANCE

A. The following materials shall be presented to the owner following the application of the work:
1. One container of finish for each color and texture utilized on the project.
2. Supply a maintenance program for Owners O&M Manual as required.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. SMA Manufacturers: Must be from the current list on SMA website under appropriate category.

2.2 PERFORMANCE REQUIREMENTS

A. VOC Limits for adhesives, sealants, fillers, coatings and primers: comply with Project requirements.

B. Fire-Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E 119 by a qualified testing agency.

C. Sound Transmission Characteristics: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for STC ratings per ASTM E 90 and classified according to ASTM E 413 by a qualified testing agency.

D. Mix Design: Provide in conformance with ASTM C926 and Specifications.

E. Sand:
1. Field mixes shall comply with ASTM C-926 and must have sand that is clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter. Sampling and testing shall comply with ASTM C144 or C897.
2. An “engineered performance mix” by an SMA manufacturer is acceptable with appropriate approvals (ICC ES, IAPMO or Intertek report).

F. Fasteners: Provide type and placement in conformance with ASTM C1063 and Specifications.

G. Expansion and Control Joints: Design and location of expansion and control joints shall be determined by the Architect and as shown on the drawings. Provide recommended locations for the Architect's approval for joints required by the following criteria but not included on the drawings. Do not modify aesthetic effect of joint locations shown on drawings or provide joints not shown on drawings without Architect's written approval.
   1. Required Expansion Joint locations:
      a. Where expansion joints occur in the substrate.
      b. Where building expansion, movement and deflection joints occur.
      c. At floor lines.
      d. Where substrate material changes.
      e. Where plaster abuts another material.
      f. At building exterior envelope plane changes.
   2. Required Control Joints: Horizontal and Vertical, required in accordance with ASTM C 1063 and as indicated on the drawings in the following locations:
      a. Corners of openings.
      b. As needed to limit monolithic wall areas to 144 square feet.
      c. As needed to constrain length-width ratio to 2.5:1 maximum.
      d. As needed to constrain control joint spacing to 18-feet maximum.

2.3 PLASTER MATERIALS

A. Portland Cement: ASTM C150, Type I or Type II.
   1. Finish Coat color: As selected by Architect, white or gray.

B. Plastic Cement: ASTM C 1328.

C. Hydrated Lime: ASTM C206, Type S, certified not less than 99 percent hydrated.

D. Colorants: None required; Reference 09 91 13 for Paint finish.

E. Sand Aggregates: ASTM C897.
   1. Gradation, Base (Scratch and Brown) Coats: Per ASTM C 926.
   2. Color for Job-Mixed Finish Coats: As selected by Architect.

F. Factory-Prepared Base Coat (Option): Provide a factory prepared mixture in sacks, superbags, or silo/mixer in lieu of the field mixed brown and scratch coat.
   1. Plaster Base Coat: Premium pre-blended cement-lime-sand mixture, with fiber that has been specially formulated for the scratch and brown coat, compatible with finish coats.
   2. ICC-ES Evaluation Report ESR-2535, Portland Cement Plaster, a premixed scratch and brown coat, a complete C926 mix: BMI Products 690 Plaster, or approved.

G. Crack-Resistant Lamina Coat: Reinforcing Fiberglass Mesh and Poly-Modified Cement Base Coat:
   1. Reinforcing Fiberglass Mesh: Resin-coated, open weave, glass fiber mesh treated for compatibility with base coat material; 11 ounce per square yard minimum weight.
   2. Poly-Modified Cement Base Coat: Adhesive Base Coat for embedding reinforcing mesh and adhering to set brown coat.
      a. Basis of Design Product: BMI 777 polymer-modified base coat.

2.4 FINISH COAT MATERIALS

A. Ready-Mixed Finish Coat Plaster painted in field: Mill-mixed Portland cement, aggregates and proprietary ingredients.

B. Primer: As recommended by manufacturer to reduce moisture migration into substrate and to increase adhesion.

C. Crack Reduction Layer:
1. Reinforcing Fiberglass Mesh: 4.5 ounce alkaline-resistant, woven glass fiber fabric fully embedded into the base scratch coat. Product recommended and provided by manufacturer of Embedment/Leveling Basecoat/Adhesive.
2. Embedment/Leveling Basecoat/Adhesive: Poly-Modified, Cement Base Coat, applied to brown coat to embed and adhere fiberglass mesh. Polymer cementitious adhesive used to embed meshes and adhere foam shapes. BMI 777 leveling coat or Parex Stucco Level Coat.

Copyright © 2021

2.5 MISCELLANEOUS MATERIALS

A. Water: Clean and potable without foreign matter.

B. Fiber Reinforcing for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in cement plaster.
1. Polypropylene fibers: 100% virgin without olefins, manufactured for cementitious material reinforcement per ASTM C 1116, Type III 4.1.3 Performance Level 1.
2. Minimum 4-ounce woven glass fiber fabrics.

C. Bonding Compound: ASTM C932.

D. Sealants: Single-Component Nonsag, Neutral Curing Silicone: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT; provide sealants per Section 07 92 00 Joint Sealants requirements.
1. Silyl-terminated polyether elastomeric sealant complying with ASTM C920 may be acceptable with Architect approval.

E. SMA-Approved Admixture: Admixtures imparting increased tensile, bond, flexural strength, and/or accelerate hydration may be submitted for Architect’s approval with finish coat manufacturer’s letter confirming product usage is acceptable and without impact on special warranty.
1. Detergent admixtures or clay to aid in pumping plaster are not allowed.

2.6 SHEATHING

A. Reference Section 06 16 00 for Sheathing.

2.7 WATER-RESISTIVE BARRIER

A. Reference Section 07 25 13 for air and water-resistive barrier membrane and ancillary products.

2.8 LATH

A. Woven-Wire Lath: Nominal No. 17 gauge (0.058 inch), 1.5-inch opening, galvanized steel complying with ASTM C1032.

B. Welded Wire: Nominal No. 16 gauge (0.065 inch), 2-inch-by-2-inch opening, or No. 17 gauge 1 ½ by 1 ½ inch opening, galvanized steel complying with ASTM C933.

C. Expanded Lath: Nominal [2.5 lb/yd2] [3.4 lb/yd2] weight, galvanized steel complying with ASTM C847.

D. Rib Lath – Soffit use only: Nominal 3.4 lb/yd2 weight, galvanized steel complying with ASTM C847.

2.9 DRAINAGE MAT.

A.

2.10 ACCESSORIES

A. Extruded Aluminum Accessories: Provide Basis of Design extruded aluminum plaster trim profiles by Flannery, Inc., or alternate manufacturer of equal products as approved by Architect.
1. General:
   a. Material: Extruded aluminum alloy 6063 T5, .050-inch-thick wall thickness.
   b. Provided trims in 10 foots lengths.
   c. Vent Slots: Vent slots for trims where specified are 1/8 inch wide and 1 inch long and configured at 1-1/2-inch o.c. lengthwise and 1/2 inch o. c. laterally. Each row lengthwise provides approximately 1 square inch of vented area per lineal foot.
   d. Vent Slot Bug Screens: Provide Vented Trims with a charcoal fiberglass bug screen to prevent insects from entering the soffit area through the vent slots.
2. Plaster Parapet Cap: Provide with manufacturer's standard prefabricated inside and outside corners as indicated in Drawings.
   a. Sizes: Manufacturer's standard profile.
   b. Finish: Factory finished 70% PVDF coating in custom color to match stucco finish.
3. Aluminum Weep Screed: AW, foundation weep screed at the bottom of a vertical wall within a plaster assembly.
   a. Sizes:
      1) AW-875.
      2) Provide sizes and shapes indicated on the Drawings.
4. J-Mold: JPM termination point between plaster and a dissimilar material.
   a. Sizes:
      1) JPM xx-xx.
      2) Provide to size and shapes indicated on the Drawings.
      3) Intersection and Corners (Prefabricated):
         a) Inside Corner
         b) Outside Corner
5. Plaster Corner Mold: PCM, create a reveal at an outside corner of a plaster assembly.
   a. Sizes:
      1) PCM xx-xx.
      2) Provide in sizes and shapes indicated on the Drawings.

B. Flashings: Reference 07 62 00 for sheet metal flashings and copings; flexible and self-adhered flashings are the work of Section 07 25 13.

C. Fasteners: Nails, staples, or screws used to rigidly secure lath and associated accessories shall be corrosion-resistant and meet the minimum requirements of ASTM C1063.

2.11 MIXES

A. General: Comply with ASTM C926 for indicated applications.

B. Fiber Content: Add fiber to base coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, up to a 1-pound fiber/cubic yard cementitious materials limit.

C. Base Coat Mixes: Portland Cement Plaster Basecoats for use over metal lath: Scratch and brown coats for three-coat plasterwork as follows:
1. Portland Cement Mixes
   a. Scratch Coat: For cementitious material, mix 1 part Portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material (sum of separate volumes of each component material).
   b. Brown Coat: For cementitious material, mix 1 part Portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material (sum of separate volumes of each component material).
2. Plastic Cement Mixes:
   a. Scratch Coat: 1 part plastic cement and 2-1/2 to 4 parts aggregate.
   b. Brown Coat: 1 part plastic cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.
3. Portland and Plastic Cement Mixes:
   a. Scratch Coat: For cementitious material, mix 1-part plastic cement and 1-part Portland cement. Use 2-1/2 to 4-parts aggregate per part of cementitious material.
   b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1-part Portland cement. Use 3 to 5-parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

D. Site-Mixed Finish Coat Mixes:
1. Portland Cement Mix: For cementitious materials, mix 1-part Portland cement and 1-1/2 to 2-parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
2. Plastic Cement Mix: Use 1 part plastic cement and 1-1/2 to 3 parts aggregate.

E. Factory-Pre-Mix Finish Coat: Comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to the application of the portland cement plaster basecoat the plastering contractor shall ensure that:
1. Surface and site conditions are ready to receive work.

2. Grounds and Blocking: Verify that the items within the walls for other sections of work have been installed, including steel door frames, cast-in anchors and structural elements.
3. Notify architect/owner of any defects that may impact the finished assembly. Proceed as directed.

B. Substrates:
1. Acceptable substrates must be sound, secure and suitable for lath and plaster, consistent with ASTM C 926.
2. Substrates and adjacent materials must be dry and clean. Substrate surface must be flat, free of protrusions or planar irregularities greater than ¼-inch in 10-feet.

C. Flashings: All flashing around windows, at deck attachments, utility penetrations, roof lines, etc. and all kick-out flashing must be properly installed prior to application of Portland cement plaster. Notify owner if flashings are missing, proceed as directed.

D. Unsatisfactory conditions or concerns shall be reported to the general contractor, architect [and owner]. Do not proceed until directed in writing by architect.

3.2 PREPARATION

A. Substrate/Framing: inspect all work prior to starting lath and plastering. Notify architect of any issues impacting performance, proceed as directed.

B. Surrounding Areas: Protect surfaces near the work of this section from damage, disfiguration, and overspray. Mask off all dissimilar materials.

3.3 INSTALLATION, GENERAL

A. General Installation: Refer to California Building Code, Chapter 25, ASTM C926, ASTM C1063, and/or the appropriate manufacturer's product data sheet for additional installation requirements and recommendations of the SMA.

3.4 PLASTER BACKING PAPER INSTALLATION

A. General-Behind Cement Plaster Substrates: Cover weather barrier membrane with weather-resistant backing papers.
1. Apply plaster backing papers to cover vertical flashing with a minimum 4-inch overlap.
2. Cut back papers on each side of the break in supporting members at expansion or control joint locations.

B. Backing Papers: Two layer application using the Single "Separate" Layer Method as described in TSIB Technical Bulletin 60.220, August 2013.
1. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing intended to drain to the water resistive barrier is directed between the layers.
2. Apply horizontally with a 2-inch overlap and a 6-inch end lap; fasten to sheathing with manufacturer-recommended fasteners.
3. Apply second layer horizontally over the first, staggering laps.

3.5 INSTALLING LATH/TRIMS

A. General: Installed per ASTM C1063 or per Architect's direction. Trims shall be full length and installed plumb/level to within 1/8 inch in eight (8) feet.

B. Weep screed shall be installed at the base of all framed walls.

C. Trims shall be attached per the trim manufacturer's instructions; however, do not exceed 24 inches on center spacing.

D. Apply lath per manufacturers recommendations. Laps shall occur at horizontal and vertical joints. Attach lath six (6) to seven (7) inches on center along framing supports (studs). Fastener shall penetrate wood by a minimum ¾ inch, penetration of wood-based sheathing shall count as 50% of dimensional lumber. Metal framing by a minimum of three (3) full threads and engage the lath.

E. Lath shall lap the flange of accessories by more than 50%.

F. Control Joints: Installed per Architects direction. Single-piece control joint may be installed over continuous lath if approved by Building Official and/or Architect. If lath is discontinuous, framing shall support lath terminations. Notify architect of issues or changes.

G. Expansion Joints: Install per Architect's direction. Two piece joints (expansion) must have lath terminate each side.

H. Contractor shall honor control or expansion joints in substrates.

I. Do not mix lath products on same wall.

J. Avoid excessive laps with expanded metal lath.

K. Do not use rib lath on walls.

L. Use wire nose corner for cement finish, PVC nose for acrylic finish.

M. Lath shall cover more than 75% of solid flanges.

3.6 MIXING

A. General: Proportion materials in each batch accurately; size batch for usage with one-hour of mixing, maximum.
   1. Retemper plaster stiffening by evaporation; partially hydrated cement plaster is not acceptable and shall be discarded.
   2. Caked, lumped materials are not acceptable.
   3. Mix factory-prepared plaster according to manufacturer's recommendations.
   4. Add the minimum amount of water necessary to produce a workable consistency to dry, mixed materials.
   5. Protect mixtures from rapid or excessive evaporation and all contaminants.

3.7 INSTALLING PORTLAND CEMENT PLASTER

A. Per ASTM C926, apply portland cement plaster by hand-troweling or machine-spraying to a nominal thickness of 3/8-inch for scratch coat. Then apply a second coat to a nominal thickness of 3/8-inch brown coat. Total basecoat shall be a nominal ¾ inch thickness.
   1. Flatness tolerance: Maximum of 1/4 inch in 10 feet from a true plane on finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
   2. Termination: Terminate plaster with casing bead and sealant joint with backer rod against metal frames and other metal elements and accessories as indicated in Drawings, but in no case less than 3/8-inch.
   3. Grout steel door frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, before lathing where necessary. Grout a minimum of six inches at each jamb anchor; fully grout where indicated or required for fire-resistance rating,
   4. Provide plaster surfaces ready to receive field-applied finishes indicated.
   5. Complete work in same plane and panel in its entirety each day.

B. Sealant: Where required to meet STC ratings for wall assemblies indicated or to keep assemblies watertight and weatherproof, seal joints between edges of plasterwork and abutting construction with appropriate sealant specified in related section. Do not seal weeps or obstruct weepholes.

C. Bonding Compound: Apply on unit masonry and concrete plaster bases, and on cut edges of existing plaster.

D. Scratch coat shall substantially cover the lath and be applied with sufficient pressure to encase the lath in cement. Slickers to apply cement plaster are prohibited. Score in a horizontal pattern.

E. Base Coat Plaster Application, mixes for use over metal lath:
   1. Apply plaster by hand or machine spray. If machine applied, use only experienced machine applicator foreman and nozzleman. Slump for machine applied plaster shall be between 2-1/2 –inches to 4 -inches at mixer and 2 –inches to 3-1/2 -inches at nozzle.
   2. Interrupt plaster coats only at junctions of plaster planes, at openings, or at control joints.
   3. Apply brown coat to scratch coat, bringing out to grounds, flat to true surface, and free of imperfections that would reflect in finish coat.
   4. Reconsolidate brown coat by floating and roughen to assure bond with finish coat.
   5. Apply finish coat in accordance with manufacturer’s instructions and uniformly float to true, even surface, 1/8-inch minimum thickness.

F. Ceilings and Soffits: Base Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; [1/2 -inch] [3/4 -inch] thick on concrete.
   1. Application of Base Coats on Lath:
      a. Scratch Coat: Apply scratch coat not less than 3/8" thick from face of supports to crest of scores, completely embedding and forming good key on metal lath. Thoroughly scratch in one direction only and keep at optimum moisture content with fog spray for 48 hours minimum before second coat is applied.
      b. Brown Coat: Reconsolidate brown coat by lightly floating after hydration of the cement has commenced and sufficient moisture has evaporated, so that surface sheen has disappeared, but before the base/brown coat has become to rigid to be moved under float.
      c. Cut back around trim edges approximately 1/16th of an inch with steel trowel to allow the finish to level off flush to the trim edges.

d. Steel trowel base coat face slightly rough to receive finish.
e. Apply finish coat in accordance with manufacturer's instructions and uniformly float to true, even surface.

G. Moist Curing: Provide in accordance with CBC Table 2512.6.
1. Maintain sufficient moisture by fine fog spraying to permit proper hydration of the cementitious materials.
2. Cure scratch coat for a minimum of 48-hours and maintain a minimum of 48-hours between application of scratch coat and brown coat.
3. Cure brown coat for a minimum of 48-hours and maintain a minimum of 7-days between the application of the brown coat and finish coat. Comply with ASTM C 926 otherwise.

H. Two-Coat Application on Solid Bases: Provide

3.8 INSTALLING BASE AND MESH (CRACK REDUCTION SYSTEM)

A. [After brown (basecoat) coat has cured, apply approved polymer enriched cement skim coat to basecoat, then trowel in to fully embed the mesh into skim coat. Insure skim coat and finish coat are compatible products. A minimum two-inch (51 mm) overlap is required at all mesh joints. This method is highly recommended for smooth trowel finish plaster.

3.9 INSTALLING FINISH COAT

A. Primer Application: Apply to all plaster surfaces using roller or spray equipment.

B. Crack Limitation Layer: fully embed Reinforcing Fiberglass Mesh into the base scratch coat with Embedment/Leveling Basecoat/Adhesive.

C. Factory Prepared Finish Coat Mixes: Comply with manufacturer's written instructions.
1. Complete entire wall at one time to prevent overlap and joining lines; cold joints and overlaps are not acceptable and will be rejected.
2. Avoid surface over working; delay troweling sufficiently to avoid drawing fines to the surface.

D. Job-Mixed Finish Coat Mixes: Comply with manufacturer's written instructions.
1. Portland Cement Mix: For cementitious materials, mix 1-part portland cement and 1-1/2 to 2-parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
2. Masonry Cement Mix: 1 part masonry cement and 1-1/2to 3 parts aggregate.
3. Portland Cement and Masonry Cement Mix: For cementitious materials, mix 1 part portland cement and 1 part masonry cement. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
4. Plastic Cement Mix: 1 part plastic cement and 1-1/2 to 3 parts aggregate.

E. Plaster Finish Coats: Match Architect's sample or as approved in Mock-up panel. as indicated; Finish coat shall be uniformly free of eye-catching imperfections.

3.10 CLEANING/PATCHING/TOLERANCE

A. Cleaning: Remove any and all materials used, overspray from adjacent surfaces, and all protective masking. Leave ready to accept specified finishes.
1. Remove stains that would adversely affect subsequent plaster finishes.

2. Repair floors, walls and other surfaces stained, marred, or otherwise damaged during plastering.

B. Patch, repair or replace plaster as needed to eliminate cracks, buckles, crazing and check cracking, dry outs, sweat outs, efflorescence, fog coating, imperfections and blisters.
1. Cracks shall be repaired per the most current SMA Crack Policy (Technical Bulletin 4).
2. Cut out and patch defective or damaged plaster.
3. Match patching or defective or damaged plaster to existing, adjacent work in form, texture and color.

C. Completed plaster surfaces shall be flat or uniformly curved, true to plane and free from scaffold and tool marks and shall be of uniform texture and color; eye catching variations in color or texture pattern will not be accepted.

3.11 PROTECTION

A. Protection: Protect applied material from inclement weather until dry and prevent it from freezing for a minimum of 24-hours after set and/or until dry. Refer to manufacturer's product data sheet for additional requirements.

B. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

3.12 THREE-COAT PLASTER ASSEMBLY SCHEDULE

A. Scratch and Brown Coats: Provide one of the following:
1. Portland Cement mix, Masonry Cement mix, Portland and Masonry Cement mix, Plastic Cement mix, Portland and Plastic Cement or Factory-prepared Base Coat mix.
2. Crack Reduction Layer: Fiberglass Mesh embedded into the base scratch coat with Embedment/Leveling Basecoat/Adhesive.
3. Finish Coat: Provide one of the following:
   a. Factory Prepared Finish Coat Mix: Mill-mixed portland cement, aggregates, and proprietary ingredients.
   b. Job-Mixed Finish Coat Mix: Portland Cement Mix, Masonry Cement Mix, Portland and Masonry Cement Mix, Plastic Cement Mix.
4. Paint Finish per Section 09 91 13 – Exterior Painting.

END OF SECTION 09 24 00

SECTION 09 30 00 – TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for tile, tile backers, setting materials, grout and accessories. Tile includes porcelain and ceramic surfacing units made from clay and other ceramic materials.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Gren Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

C. Tile Council of North America (TCNA)
1. Handbook for Ceramic, Glass and Stone Tile installation, current edition.

D. American National Standards Institute, Inc. (ANSI):
1. American National Standard Specifications for the Installation of Ceramic Tile.

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 Series of tile installation standards and in ANSI A137.1 apply to Work in this Section unless specified otherwise.

B. Module Size: Actual tile size plus joint width indicated.

C. Face Size: Actual Tile size, excluding spacer lugs.

D. Large Format Tile; Tile with any edge greater than 15 inches.

E. Wet Area: Includes tile surfaces that are either soaked, saturated, or routinely subjected to moisture, including but not limited to tub and shoer enclosures, swimming pools and soaking tubs, commercial kitchens and exterior areas.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
1. Coordinate tile work with drain bodies and construction of bonding substrates including but not limited to compliance with tolerances per requirements for Project Meetings.
2. Review requirements in ANSI A108.01 for substrates and for preparation by other trades including but not limited to General Contractor, Architect, Setting Material Representative, and Tile Installer.

B. Schedule and Sequence work of this Section to minimize duration of waterproofing and crack isolation membrane exposure to construction traffic and potential sources of damage.

1.5 SUBMITTALS

A. Product Data: Waterproofing, setting materials, and grout; provide for other products as requested.

B. CALGreen Submittals: Product Data VOC Limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 81 13.17.

C. Shop Drawings: Tile patterns, locations and widths of control, contraction and expansion joints in tile surfaces, perimeter conditions and floor-to-wall transitions.
1. Demonstrate coordination of tile pattern with fixtures, access doors and similar components interrupting or penetrating ceramic tile.
2. Provide installers propose details for movement joints and perimeter relief.

D. Samples: Provide the following quantities for each tile type and color required.
1. Porcelain and Ceramic Floor and Wall Tiles: Four pieces.
2. Accessory Tile: Two full size units of each accessory required, and 6-inch length of transition and edge strips.
3. Grout: Each color required, paired with sample tile of the type and color the grout is specified for.

E. Certificates: ANSI A137.1 Master Grade Certificate signed by manufacturer.

1.6 QUALITY ASSURANCE

A. Advance Installation Field Sample: Prior to installation of other work; acceptable sample may be incorporated into the Work.
1. Nominal 100 square feet of pattern shown and laid-out to include three tile types and coordinated with overall installation. Demonstrate each type of soft joint proposed for the work.

1.7 PROJECT CONDITIONS

A. Environmental Requirements: Ambient temperature not less than 50 degrees F in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.8 MAINTENANCE

A. Extra Materials: 2 percent of installed quantity, but not less than one box. From same manufactured lot as materials installed, labeled, and in protective packaging; deliver to Owner as directed.

1.9 SPECIAL WARRANTY

A. Project Warranty: Signed by authorized representative of the Manufacturer, Installer and Contractor, agreeing to replace defective Work, and Work not in compliance with the Contract Documents at no cost to the Owner. Defective Work includes, but is not limited to, bond

failure of any tiling components, and waterproof anti-fracture membrane failure. The warranty period shall be not less than 3 years following Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

1. VOC Limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 81 13.17.
2. Slip Resistance of Walking Surface: Coefficient of Friction, Anti-Slip Surface per ANSI A 137.1, ANSI B101.1; Static and ANSI B101.3 Dynamic Coefficient of Friction not less than 0.42 and 0.35 respectively.
3. Slip Resistance of Floor Tile: Compliance with minimum recommendations for specific service environment and flooring type when evaluated per
   a. HB 198/AS 4663-2013 test pendulum slip test method.

DIN 18032 Part II 2001 limits.

2.2 MANUFACTURERS

A. Setting Materials: To the greatest extent possible and as necessary for compliance with the specified Special Warranty setting materials shall be products of a single manufacturer. Products not produced by the principal manufacturer of the setting materials shall be approved by them and included in the warranty required without limitation and at no additional cost to the Owner.

2.3 TILE TYPES

A. Ceramic Tile Types: ANSI A137.1 and as follows for the basis of design products.
   1. Porcelain: Floor Tile:
      a. TF1: Daltile. Haute Monde.
         1) Size: 12”x24”
         2) Color: Glitterati Granite.
         3) Grout: As Scheduled in Drawings.
      b. Ceramic Tile Base CTB: As required for CT-1, special base unit.
   2. Glazed Ceramic Wall Tile:
      a. TW1: Fireclay. Norman Brick.
         1) Size: 2.5 x 8 inches.
         2) Color and Finish: As Scheduled in Drawings.
         3) Grout: As Scheduled in Drawings.
         4) Trim: Provide styles and shapes as indicated.
      b. TW2: Fireclay. Brick.
         1) Finish: Gloss with Engobe.
         2) Size: 2.5 x 8 inches.
         3) Color and Finish: As Scheduled in Drawings.
         4) Grout: As Scheduled in Drawings.
         5) Trim: Provide styles and shapes as indicated.
      c. TW3: Daltile Color Wheel Linear.
         1) Finish: Gloss.
         2) Size: 2 x 8 inches.
         3) Color and Finish: As Scheduled in Drawings.
         4) Grout: As Scheduled in Drawings.
         5) Trim: Provide styles and shapes as indicated.

d. TW4: Daltile Color Wheel Linear.
   1) Size: 2 x 8 inches.
   2) Color and Finish: As Scheduled in Drawings.
   3) Grout: As Scheduled in Drawings.
   4) Trim: Schluter Jolly, Color TBD.
e. TW5 Cove Base: Daltile.
   1) Size: 6 x 12 inches.
   2) Color and Finish: As Scheduled in Drawings.
   3) Grout: As Scheduled in Drawings.
f. TW6 Cove Base: Daltile Flat Top Cove Base.
   1) Size: 4 x 12 inches.
   2) Color and Finish: As Scheduled in Drawings.
   3) Grout: As Scheduled in Drawings.
g. TW7 Cove Base: Daltile Bullnosed Cove Base.
   1) Size: 4 x 12 inches.
   2) Color and Finish: As Scheduled in Drawings.
   3) Grout: As Scheduled in Drawings.
h. TW8 Wall Tile Trim: Cove Base: Jolly Trim.
   1) Size: 1/2 x 12 inches.
   2) Color and Finish: As Scheduled in Drawings.
   3) Grout: As Scheduled in Drawings.

B. Protective Coating: Temporary film compatible with tile and grout, removable without damaging tile nor grout, to protect exposed surfaces of unglazed quarry tile from mortar and grout stains; do not coat bedding surfaces.

2.4 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
   1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16-ich above adjacent floor surface bevel top at threshold top surface; limit threshold height to ½-inch above adjacent floor surface.

2.5 SETTING MATERIALS

A. Tile Installation Materials: Grout, mortar, adhesives, and other accessories; Comply with ANSI 136.1, and ANSI Series 108 and 118 reference standards for products and installations required.
   1. Provide installation products to comply with specified performance and appearance and qualified to receive the required Project warranty.

B. Waterproof and Anti-fracture Membrane: ANSI A 118.10 and 118.12 compliant and approved for use as a shower pan and classified by the manufacturer for heavy-duty commercial applications; qualified for the specified system warranty. Fabric reinforced, fluid-applied membrane, Custom Building Products 9240.

C. Portland Cement Mortar: Provide products for on-grade and elevated slabs for specific installations required. Ensure mortar is compatible with waterproofing membrane; provide product compatible with the grout specified with.
   1. Dry-Set Ceramic Tile: ANSI A118.1 Dry-Set Portland Cement mortar.
   2. Epoxy Mortar: ANSI A118.3, compatible with waterproofing membrane.

3. Mortar Bed: Comply with ANSI 108.1B and suitable to establish required slope for tile installation over structural concrete slab in thickness necessary for required slab depressions and drain locations.

D. Latex-Portland Cement Mortar (Thinset): ANSI A118.4.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Ardex Americas.
b. Bostik, Inc.
c. Custom Building Products.
d. Laticrete.
e. Mapei.

E. Grout: Water cleanable epoxy grout complying with ANSI A 118.3, Custom Building Products unless otherwise specified. Provide the following colors for the tile Type specified.
1. Laticrete Epoxy Grout Color as Scheduled in Drawings..

F. Provide sealants, joint fillers, and related materials compatible with one another and joint substrates under conditions of service and application, as demonstrated by testing and field experience; and as required in Section 07 92 00.
1. Match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
2. Site Fabricated Perimeter Expansion Joint: provide an approved gasket material or gun-grade silicone seal per installers approved detail for movement joints.
a. Joint Width: 0.25 inch
3. Sealant Joints: Comply with Section 07 92 00 requirements for sealants.

G. Cementitious Backer Units (CBU): ASTM C 1325 and ASNI 118.9 0.5 and 0.625 inch thick 4 by 8-foot panels as indicated; double-wrapped edges, USG DUROCK Cement Board, National Gypsum or approved.

H. Gypsum Tile Wall Backing: Comply with Section 09 21 00 requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Installer shall verify that substrates to receive tile work and conditions under which tile will be installed are acceptable and conform to Project requirements; notify contractor of unacceptable conditions and do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. In advance of installation work lay-out complete tile pattern in each space having non-parallel walls and trapezoidal spaces not having normal corners. Adjust tile pattern to avoid cut unit less than 2 inches in any dimension and to maintain constant grout joint dimension across the floor or wall. Obtain approval of pattern lay-out prior to starting installation.

3.3 INSTALLATION

A. As applicable to installations required, comply with ANSI 136.1, ANSI 108 Series, and ANSI 118 series standards and TCA Handbook for Ceramic Tile Installation, unless otherwise indicated.
   1. Tile Floor: Full coverage with crack isolation membrane; CTI F125-Full, provide dry-set membrane bond coat and mortar bond coat for tile in lieu of latex-modified Portland cement.
   2. Tile Wall: Substrate as required by Partition Types indicated:
      a. Fiber Cement Board underlayment over required gypsum board; comply with CTI W244C with waterproof membrane.
      b. Inorganic matt reinforced gypsum panel substrate; CTI W245 with epoxy grout.

B. Waterproofing and Anti-fracture Membrane: Provide positive drainage slope where indicated for floor drains. Fill slab deviations to achieve uniformly flat or sloped floor and smooth finish surface; provide required transition to adjacent finish flooring. Provide waterproofing and anti-fracture membrane throughout all tile floor assemblies and form a contiguous barrier to water with watertight seal at joints between sheets, at all penetrations and to 6 inches above horizontal-to-vertical transitions.
   1. Membrane Bond Coat: Unmodified Portland cement mortar complying with membrane manufacturer's recommendations for specific installations required. Give particular attention to fluid consistency of mortar for effective bond of membrane.
   2. Provide waterproofing membrane on wet-walls to termination of tile work.
   3. Coordinate installation of membrane and waterproofing accessories with floor drain, , floor sink and other items embedded in or penetrating through the tile assembly.
   4. Thread a layer of waterproofing membrane over penetration and lap on to uncoupling membrane a minimum of 6 inches in all directions and bond water-tight to uncoupling membrane.

C. Provide uniform coverage and appearance in spaces indicated to receive tile; accurately fit to permanent fixtures, building structure, walls, obstructions, intersections, and returns; extend into toe spaces, reveals, and similar openings. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
   1. Cut and drill tile without damage to visible surfaces.
   2. Neatly grind cut edges of tile abutting trim, finish and built-in items for straight aligned joints.
   3. Fit tile to outlets, fixtures and penetrations so that collars, and covers overlap tile properly.
   4. Cove Base set for flush transition between toe of coved base and floor tile.
   5. Layout tile in pattern indicated for floor and walls. Coordinate wall-mounted components and fixtures with tile pattern. Provide uniform joint widths between sheets and units, align tiles in adjoining surfaces where tile module permits
   6. Site Fabricated Perimeter Expansion Joint: Provide an approved detail for contiguous movement joint at floor-to-wall transitions in tile flooring.

D. Metal Edge Strips: Install at locations indicated and where exposed edge of tile finishes flush with adjacent surface.

3.4 CLEANING

A. Upon completion of placement and grouting, clean ceramic tile surfaces; remove foreign matter and protective coatings; Use cleaning materials and methods recommended by tile

and grout manufacturers. Protect adjacent surfaces from damage due to cleaning operations. Thoroughly rinse surfaces cleaned with chemicals so that no residue is left.

B. Replace broken, cracked, chipped and misaligned units, and work not complying with Project requirements.

3.5 PROTECTION

A. Install and maintain coatings, covers, boards and other measures necessary to protect installed tile from damage due to subsequent construction activities until final acceptance of the work; Remove protection and clean tile not more than five days before final inspection.
   1. Prohibit foot and wheel traffic from using tiled floors for not less than seven days after grouting is completed.
   2. Prohibit work on completed tile floors where acceptable protection is not in place and properly maintained clean, secure against displacement, and movement.

END OF SECTION

SECTION 09 51 00 – ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for acoustical ceilings, metal suspension systems, and accessories.

B. Related Sections:
1. Section 01 81 13.17 Sustainable Design Requirements - CALGreen
2. Division 23 Sections, HVAC.
3. Division 26 Sections, Electrical.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

C. ASTM International standards and testing procedures as listed in this Section.

1.3 DEFINITIONS

A. CAD: Ceiling Attenuation Class.

B. LR: Light Reflectance.

C. NRC: Noise Reduction Coefficient.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Comply with requirements for Project Meetings; provide coordination of building systems and other work to be performed above finish ceiling elevation.
1. Verify compliance with finish ceiling elevations and accommodation of all work necessary in the space between the finish ceiling and underside of structure, including but not limited to beams and other structure restricting ceiling plenum space.
2. Layout of items penetrating finish ceilings and coordination with ceiling support connections to structure, trim and perimeter edging as required.
3. Confirmation of painting requirements for plenum spaces exposed to view at termination of suspended finish ceiling assembly.

1.5 SUBMITTALS

A. Product Data: Required for ceiling panels, suspension systems, and accessories; including maintenance instructions.

B. CALGreen Submittals:
   1. Product Data-VOC limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with limits specified.
   2. Low/No VOC Paints and Coatings: Provide certification that all primers and coatings meet specified VOC emission limits. List manufacturer, brand, application, finish, and VOC emissions per gallon in grams per liter. Include product data sheet indicating VOC limits for each product provided.

C. Shop Drawings:
   1. Ceiling support assembly seismic loading resistance; including resolution of conflicts between building system assemblies and ceiling suspension. Provide drawings and calculations stamped by Contractor's registered structural engineer for work that does not have ICC-ES certification demonstrating compliance with System Description Article.
   2. Reflected ceiling plan documenting coordination of penetrations and ceiling-mounted items. Indicate ceiling suspension members and location and method of attachment to building structure complying with Performance Requirements.
   3. Coordination with building systems including but not limited to HVAC, plumbing, electrical, fire suppression and communication, and requirements for exposed structure.
   4. Intermediate Supports for Ceiling Suspension Systems: As necessary for specialty and custom ceiling assemblies.

D. Samples: Color, finish and type required; 12 inches square of ceiling panels, and 12 inches length of suspension systems.

E. Test Results: ICC-ES reports for metal suspension systems, and ceiling panels; comply with performance requirements.

1.6 PROJECT CONDITIONS

A. Installation Areas: Enclosed, and weatherproof; wet-work complete and nominally dry, and work above ceilings complete; ambient temperature and humidity continuously maintained at values near those indicated for final occupancy.

1.7 MAINTENANCE

A. Extra Materials: Full size units equal to one percent of each type of acoustic panel installed. Deliver to Owner as directed.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Suspension System: OSSC Section 803 and Chapter 16, ASTM C 635, ASTM E 580 and Northwest Wall and Ceiling Bureau Technical Bulletin 401 OREGON.
   2. Coordination of Ceiling Suspension Support with Building Structure and Other Building Systems: Where direct anchorage to building structure is impractical due to conflict with mechanical, plumbing electrical or other building system assemblies provide fully engineered alternative for anchorage of ceiling suspension assembly. Coordinate with

work of HVAC, plumbing and electrical systems, identify potential areas of conflict for anchorage and support of suspended ceiling assembly and provide engineered solution in advance of installation.

3. Metal suspension systems specified in this Section shall be coordinated with work of Section 09 21 00 for support of gypsum board ceilings and Section 09 54 13 as required for support of specialty ceiling assemblies.
   a. Walkable Ceiling: Comply with Section 05 40 00 requirements for support assembly.

B. Performance Requirements:
1. Ceiling Components: UL tested and labeled for flame spread 25, and smoke development 50, and required fire resistance.
2. Seismic Design: Comply with OSSC Chapter 16 requirements utilizing Project specific criteria for Use Group, Design Category, Building Configuration and Site Classification.

2.2 MATERIALS

A. Metal Suspension Systems: ASTM C 635; Indirect Hung Suspension System; Heavy Duty. white enamel finish except as otherwise required for supports and perimeter components at ACP-1.
1. ACP-1: 15/16-inch Grid, Blizzard White.
2. Gypsum Board Ceilings: Armstrong Drywall Grid with 1.5-inch flange.
   a. Provide attachment, angle and transition clips and other accessories as necessary for ceiling configuration and installation types required.
3. Wall ‘Shadow’ Molding: Accommodate movement required by Performance Requirements; coordinate with suspension system, and panel edge detail; provide ICC certification of product compliance with requirements.
4. Penetrations: Escutcheon and other trim configured to fit the penetration, provide edge detail and finished appearance acceptable to Architect.

B. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung; type recommended by suspension system manufacturer for installation as required.
1. Concrete Embeds: Hot-dipped galvanized sheet steel designed for attachment of hangers.
2. Powder Actuated: Provide ICC-ES Report for pull-out resistance in directed tension and approval of regulatory official having jurisdiction over the Project. Oversize load factor as required.
3. Hanger Wire: sized so that stress at 3-times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gage.

C. Acoustic Ceiling Panels:
1. ACT1: Armstrong Optima Tegular Silhouette ¼-inch reveal grid.
   a. Size: See Drawings, 48 x 48 inches.
   b. Finish: VFY-Fine Texture.
   c. Color: White.
   d. NRC: VFY-0.95.
   e. Provide shadow molding (by Contractor).
2. ACT2: Armstrong Optima Tegular Silhouette ¼-inch reveal grid.
   a. Size: 24 x 48 inches.
   b. Finish: VFY-Fine Texture.
   c. Color: White.
   d. NRC: VFY-0.95.
   e. Provide shadow molding (by Contractor).

3. ACT3: Armstrong Optima Square lay-in, with 15/16-inch narrow grid.
   a. Size: 24 x 24 inches.
   b. Finish: VFY-Fine Texture.
   c. Color: White.
   d. NRC: VFY-0.95.
   e. Provide shadow molding (by Contractor).
4. ACT4: Armstrong Calla; Square tegular, with 15/16-inch narrow grid.
   a. Size: 24 x 24 inches.
   b. Finish: VFY-Fine Texture.
   c. Color: White.
   d. NRC: 0.85.
   e. CAC: 35.
   f. Provide shadow molding (by Contractor).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Furnish ceiling layout, and inserts, clips, and support materials, to be installed by other trades well in advance of time needed for coordination.

B. Coordinate layout and installation with other work supported by and penetrating through ceiling; light fixtures, mechanical and electrical equipment, fire-suppression system components, and partitions.
   1. Measure ceiling area and layout as indicated, balance border widths at opposite edges of ceiling, avoid use of less-than-half width units.

C. Verify framing assembly to support T-bar grid and attachment of specialty ceiling panels have been coordinated with building systems and panel assembly requirements; correct work that has not been properly coordinated and as necessary due to conflicts with other systems.

3.2 INSTALLATION

A. Comply with Project requirements, governing regulations, and manufacturers' instructions.
   1. Panel Orientation: As indicated, if not indicated orient directionally patterned panels in one direction.

B. Suspension System: ASTM C 636 and E 580; level, square to vertical surfaces; hangers supported only from building structure.
   1. Provide manufacturer's standard joint configuration for exposed flanges of intersecting suspension system members, for uniform, neat well-crafted joints. Miter exposed corners, unless otherwise acceptable.
   2. In lieu of installing suspension system per Design Requirements, provide certified design by registered engineer.
   3. Molding: At ceiling perimeter and penetrations, to conceal panel edges; provide spring spacers for panels in concealed suspension systems. Support moldings not adjacent to runners as required for suspension system, unless otherwise indicated
   4. Floating Installation: Provide perimeter reveal gap as necessary to center panel group in structural bay or other area as indicated; dimension of gap will vary depending on actual space available. Use only full-size panels. Provide extruded aluminum trim as specified.

5. Mechanically fasten wall moldings to vertical surfaces 16 inches on center, and 3 inches from ends.
6. Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.

C. Hangers: 48 inches on center, provide additional hangers at light fixtures, and 6 inches from vertical surfaces, unless otherwise indicated.
1. Install plumb, free from contact with insulation and other objects in ceiling plenum not part of supporting structure nor suspension system.
2. Do not splay wires more than 3 inches in a four-foot vertical drop, unless otherwise acceptable; wrap main runners at least three times.

D. Acoustical Panels: Level in straight regular courses, with proper joints for intended appearance. Scribe and cut for accurate fit at borders and around penetrating work.
1. Tegular Jointed Panels: Rout edges of cut panels and finish to match appearance of factory formed edges.

E. Gypsum Board Ceilings: Install suspension system as required for work of this Section and coordinate with work of Section 09 21 00.

F. Tolerance for System Level and Elevation: Comply with limitations in ASTM C 636 for metal suspension system regardless of whether assembly supported is lay-in or mechanically attached.
1. Shim supports directly mounted to structure and provide adjustable hangers and indirect supports for assemblies not directly applied to structure as necessary to comply with tolerance limitations.

3.3 ADJUST AND CLEAN

A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members; comply with manufacturers' instructions for cleaning and touch-up of minor finish damage.

B. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 54 34 – WOOD ALTERNATIVE CEILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for wood alternative ceiling panel and associated suspension systems as required for horizontal applications.

1.2 RELATED REQUIREMENTS

A. Section 01 81 13.17 Sustainable Design Requirements – CALGreen.

B. Section 09 81 00 Acoustical Insulation.

C. Divisions 21, 23, 27, 28 for coordination of ceiling-mounted equipment.

1.3 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Gren Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Comply with requirements for Project Meetings; provide coordination of building systems and other work to be performed above finish ceiling elevation.
   1. Verify compliance with finish ceiling elevations and accommodation of all work necessary in the space between the finish ceiling and underside of structure, including but not limited to beams and other structure restricting ceiling plenum space.
      a. Confirmation of painting requirements for plenum spaces exposed to view at termination of suspended finish ceiling assembly.
   2. Layout panels in advance of fabrication and accommodate cut panels and custom sizes as necessary for factory applied edging on panels of items penetrating finish panel assemblies and coordination with panel support connections to structure, trim and perimeter edging as required.
   3. Coordinate layout and installation of panel assemblies and support components with other work penetrating or located within panel, including without limitation light fixtures, mechanical components, controls, fire suppression system components and other devices.

1.5 SUBMITTALS

A. Product Data: Required for ceiling and suspension systems, and accessories; including maintenance instructions.

B. CALGreen Submittals:
   1. Product Data-VOC limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with limits specified.
   2. Composite Wood Formaldehyde Limits: Provide certification that all products meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as Specified.

C. Shop Drawings: Document Project installations and assemblies compliance with System Description requirements; detail support assembly, integration of other components with panels, coordination with work concealed behind panels and work to be accessed through panels once installed.
   1. Coordinate with requirements for panel assembly support systems and connections to work of other Sections, and requirements of this Section including but not limited to attachment and support conditions, appearance, tolerance compliance and plenum access.
   2. Provide drawings and calculations stamped by Contractor's registered structural engineer for work that does not have ICC-ES certification of seismic compliance. Seismic load resistance shall include resolution of conflicts between building system assemblies and ceiling suspension.
   3. Reflected ceiling plan and wall elevations documenting coordination of penetrations and items mounted to or through panels. Indicate panel support members, location and method of attachment to complying with Performance Requirements.
   4. Coordination Drawing: As required for mechanical ventilation, indicate extent and location where perforated metal panel backing is required in lieu of scrim and acoustic backing.
      a. Ceiling penetration and coordination with building systems and fixtures.
      b. Field verified measurements coordinated with work of Division 26 for Fixtures.

D. Samples: Provide fabricated panel finished as required.
   1. Two by two-foot square panel demonstrating joinery of abutting panels. Back panels with required scrim.

1.6 PROJECT CONDITIONS

A. Installation Areas: Enclosed, and weatherproof; wet-work complete and nominally dry, and work above ceilings complete; ambient temperature and humidity continuously maintained at values near those indicated for final occupancy.

B. Existing Conditions: The Contractor shall verify prior to making required submittals that the ceiling components match similar existing assemblies as required.
   1. Specified Products: For Contractor information only, the Contractor is responsible for providing components that match existing assemblies regardless of products listed.

C. Extra Materials: Full size units equal to three percent of each type of panel assembly installed, including supports and accessory components; deliver as directed.

1.7 QUALITY ASSURANCE

A. Fabricator: Work of a single entity unless otherwise acceptable. Demonstrate minimum of five years successful experience with custom wood panel assemblies similar in type, complexity and scope as required for the Work on projects of similar size and quality to that required.

1. Delegated Design: Fabricator responsible to provide services of Professional Engineer Registered in the State of the Project who shall have direct responsibility and control for completion of delegated design work.

B. Installer: Firm shall have documented experience on no fewer than 5 projects of a similar nature in the past five years and be acceptable to the fabricator unless otherwise approved.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Requirements indicated establish basic design intent, dimensions, profiles and configuration. Provide modifications to standard systems and additional details and components as necessary to achieve the design intent including member sizes, profiles and configuration.
   1. Panel Support Assemblies: Comply with System Description for panel configuration and installation type required. Provide Professional Engineering services necessary for final design of custom support systems and for standard assemblies not having ICC-ES approval and modifications not conforming to parameters of ICC-ES Report.
      a. Determine attachments to supporting building construction and provide all components necessary.
      b. Identify in advance of execution all potential areas of conflict for attachment of support assembly to structure including but not limited to mechanical, plumbing, fire suppression and electrical systems; effect necessary modifications and provide custom fabrications where necessary to resolve the conflict.
   2. Provide for concealed attachment of ceiling planks and panels with downward accessibility where required. Attachments for planks and panels shall not restrain material against movement due to cyclical change of environmental moisture where this could result in splits or cracks in the material with particular attention given to end splits.

B. Performance Requirements: Comply with General Structural notes in General Structural note on S series drawings for Project specific performance criteria.
   1. Structural Design Criteria: Comply with CBC Title 24 Chapter 16 requirements utilizing Project specific criteria for Use Group, Design Category, Building Configuration and Site Classification and additional criteria in the General Structural Notes.
   2. Panel Deflection: When subjected to required forces and conditions of service.
      a. Ceiling: Less than 0.002778 inch in greatest panel dimension.
   3. Fire Performance: Provide transparent treatment of wood components for Class A Flame Spread and Smoke Development; comply with 30-minute flame spread test when necessary for regulatory approval.

2.2 MANUFACTURED COMPONENTS

A. T-Bar Suspension System for Ceiling: 15/16 Heavy Duty grid members complying with Section 09 51 00 requirements and coordinate with framing provided as work of Section 09 22 16.
   1. Include all components, anchors, hangers, channels and runners, wall molding and accessories as necessary for complete installation.
   2. Modify standard components and provide custom fabrications as necessary for assembly configuration required and attachment of the specified wood ceiling panels.

3. Attachment Devices for Suspension System and Wood Ceiling: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung; type recommended by suspension system manufacturer for installation as required.
4. Hold-Down Clips: For exterior ceilings and where indicated for interior ceilings, provide hold-down clips spaced not to exceed 24 inches on center on all cross tees.

B. Composite Polymer Ceilings: Specified slat panel assembly with acoustic backing as required for horizontal applications indicated. Complete panel fabrication and finishing in the shop with panels configured for installation required. Configure assembly for concealed mechanical attachment to supporting construction for ceiling installation. Provide standard components, modified where necessary for assembly types and configurations required.
1. Provide profile as indicated using a combination of manufacturer's standard profiles or components for panel sizes, configuration and profile required; Rulon Endure 800 is the basis of design.
   a. Slat size: 3 ¼-inch by ¾-inch.
   b. Slat spacing: Four members per lineal foot (3” OC spacing).
   c. Finish: TBD.
   d. Suspension: Black T-Bar.
2. Scrim Backing and Acoustic Fabric Insulation: Provide throughout Wood Grille Panels except as required for select locations with mechanical ventilation through the wood grille.
   a. Reveal Scrim Backing: Black, SoundTex Acoustic woven nylon scrim.
   b. Insulation: Minimum 1.5-inches black acoustical board or blanket, Owens Corning SelectSound Black Blanket, Knauf Black Acoustical Board or approved.
3. Edges and Trim: Specified solid stock edge banding for panel configuration and profile indicated.
4. Backing Cross Piece: Concealed from view in completed assembly per approved design.

C. Shop Finish:
1. Support Components, Backing and Suspension System: Manufacturer's shop applied system; matte black.
2. As selected by Architect from manufacturer’s standard color and pattern options.

2.3 ACCESSORIES

A. Provide escutcheons and trim components for panel penetrations and profiles required. Configure for penetration, and edge conditions required and finished as required for panels.

B. Perimeter Trim: As indicated or as selected by Architect from Manufacturer’s standard trim options.

PART 3 - EXECUTION

3.1 PREPARATION

A. Furnish panel layout, support assembly and connection materials, to be installed by other trades well in advance of time needed for coordination.

B. Coordinate layout and installation with other work supported by and penetrating through ceiling; light fixtures, mechanical and electrical equipment, fire-suppression system components, and partitions.

3.2 INSTALLATION

A. Provide continuity of appearance throughout ceiling area. Install level in straight regular courses, with proper joints for intended appearance. Field cutting of panels to size is not acceptable; provide factory fabrication of panels with solid stock edging as required.
   1. Orientation of Linear Ceiling Panels: As indicated and for ceiling pattern and configuration required.
   2. Coordinate panels with mechanical system. Omit acoustical treatments where mechanical ventilation is required through the panel and install perforated metal backing furnished as work of Section 05 50 00 per the approved design.

B. Suspension System: ASTM C 636; level, square to vertical surfaces; hangers supported only from building structure. Provide for downward-accessible torsion spring panel installation.
   1. Provide manufacturer's standard joint configuration for exposed flanges of intersecting suspension system members, for uniform, neat well-crafted joints. Miter exposed corners, unless otherwise acceptable.
   2. Install support assembly complying with System Description requirements and approved submittals of fabricator's delegated design engineer.

C. Hangers: 48 inches on center, provide additional hangers at light fixtures, and 6 inches from vertical surfaces, unless otherwise indicated.
   1. Limit fastener penetration in post-tensioned slab to 0.75 inch unless approved otherwise; deeper fastener placement may require locating reinforcing tendons prior to fastener placement.
   2. Install plumb, free from contact with insulation and other objects in ceiling plenum not part of supporting structure nor suspension system.
   3. Do not splay wires more than 3 inches in a four-foot vertical drop, unless otherwise acceptable; wrap main runners at least three times.

3.3 ADJUST AND CLEAN

A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members; comply with manufacturers' instructions for cleaning and touch-up of minor finish damage.

B. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 00 – RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for resilient floor coverings and accessory products.

B. Related Sections:
1. Section 01 81 13.17 Sustainable Design Requirements – CALGreen.
2. Section 09 05 00 Moisture Control System.

1.2 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Gren Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

C. ASTM International standards and testing procedures as listed in this Section.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequence: Where she Set vinyl floor covering is Scheduled it shall be installed over the complete floor area, including under areas indicated to receive casework, fixed equipment and similar components. Flooring installation shall be completed prior to installation of laboratory casework and equipment.

B. Schedule: Coordinate overall work sequence and Project schedule to allow the time necessary for substrate to cure and dry to within resilient flooring manufacturer's recommended moisture and pH levels as measured using the specified field tests without delay to the progress of the Work, and to allow completion of the Work within the Contract Time.
1. Contractor shall be responsible for achieving resilient floor manufacturer's required vapor pressure and pH requirements without delay to the Work and at no additional cost to the Owner.
2. Contractor shall coordinate scheduling of tests for moisture and pH levels to allow sufficient time for correction of non-compliant substrate conditions without delay to the finish floor installation and overall progress of the Work. Allow a minimum of 30 days prior to date scheduled for flooring installation in each work area.
3. Contractor shall be responsible for providing effective means to achieve the required installation conditions; these may include but are not necessarily limited to desiccant drying and associated temporary environmental controls, and vapor emission control treatments.

C. Preinstallation Conference: Schedule as required where complex patterns, unusual building geometry, static dissipative flooring and other uncommon installation requirements pertain.

1.4 SUBMITTALS

A. Product Data: Required for each product to be incorporated into the Work; include seaming method, and maintenance instructions for exposed material.

B. CALGreen Submittals:
1. Product Data-VOC limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with limits specified.
2. Product Data – Resilient Flooring: Documentation from an independent testing agency indicating compliance with the Floor Score Standard, or evidence of listing on the RFCI FloorScore database, or evidence of listing on the CHPS Product Registry.

C. Samples: Type, color and pattern required, showing full range of color and pattern variations to be expected in final work.
1. Tiles: Full size.
2. Sheet Goods: 12 by 12 inches.
3. Base, and linear Goods: Two feet length.

D. Shop Drawings: Indicate layout of floor covering pattern, seam locations and seaming method.
1. Due to building geometry installation spaces may have non-parallel walls, and finish floor patterns will require specially cut shapes and advance layout of patterns in many spaces to avoid unacceptable termination of patterns and conflicts in the Work. Provide layout plans showing acceptable resolution of finish floor patterns and coordination with building geometry.
a. Indicate minor adjustments to flooring pattern that could resolve conflicts with building geometry and flooring pattern for Architect review.

E. Mock-Up: Resilient flooring, approximately 100 square feet in configuration and pattern indicated. Acceptable mock-up may be incorporated in final work.

F. Contractor's Vapor Emission Control Plan: Provide as specified in Section 01 31 00 Project Coordination.

1.5 MAINTENANCE MATERIAL

A. Extra Materials: From same manufactured lot as materials installed, labeled, and in protective packaging; deliver to Owner as directed.
1. Tile: Not less than one box for every 50 boxes installed
2. Sheet Goods, Treads, Risers, Skirts and Base: Five yards of each type, color and pattern installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Three years successful experience with products and installations required and certified by flooring manufacturer.

B. Preparatory Testing of flooring Substrates: Technician current certification by International Concrete Repair Institute as a Concrete Slab Moisture Testing Technician and otherwise be familiar with testing methods and procedures for the work and fully capable of producing consistent and accurate test data with including but not limited to expertise in the following.
1. ASTM F 1896 MVER moisture vapor emission rate.

2. ASTM F 2170 rH of concrete substrates.
3. ASTM F 2659 electronic moisture meter measurements.
4. ASTM F 710 pH assessment of concrete substrate.
5. ASTM F 2170 testing methodology and protocols.

1.7 PROJECT CONDITIONS

A. Environmental Requirements: Ambient temperature in installation space of 65 degrees F 48 hours prior to, during, and following installation; maintain ambient temperature of not less than 60 degrees thereafter; condition material in installation space for 48 hours prior to installation.
1. Contractor shall be responsible for achieving manufacturer's required vapor pressure and pH requirements without delay to the Work and at no additional cost to the Owner.
2. Contractor shall be responsible for providing effective means to achieve the required installation conditions; these may include but are not necessarily limited to desiccant drying and associated temporary environmental controls, and vapor emission control treatments.

B. Vapor Emission Control and pH Control: Contractor shall determine most effective method or combination of methods to achieve the required installation conditions. Contractor shall be responsible to provide means and methods to effectively establish the moisture and pH levels required for the finish flooring and in compliance with the Construction schedule at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Subject to compliance with Project requirements provide products Basis of Design products as Scheduled in the Drawings with accessories including primers, adhesives, and leveling compounds manufactured and recommended by flooring manufacturer for products and installation conditions required.

B. Resilient Flooring Performance Requirements:
1. Critical Radiant Flux (CRF): 0.45 watts per square centimeter.
2. Flame Spread: ASTM E 84; 75.
3. Smoke Developed: ASTM E 84; 450.
4. Smoke Density: ASTM E 662; 450.
5. Walking Surface: Coefficient of Friction Not less than 0.42 Static and 0.35 Dynamic on non-sloped surfaces and Traction Values necessary to qualify as NFSI High Traction surface when evaluated per ANSI B101.1 and 101.3.

C. Environmental Certifications:
1. Compliance with limitations on chemical compounds and VOC limits for adhesives, sealants, filler, primers, and coatings; comply with 01 81 13.17 Sustainable Design Requirements – CALGreen.
2. Recycled Content: Post Consumer; Post Industrial.
3. FloorScore Certification and compliance with California Depart of Health Section 1350 requirements.

2.2 SHEET FLOORING

A. Linoleum Sheet: Homogenous mixture of linseed oil, cork, wood flour, rosin binders, dry pigments calendared onto jute backing; pattern and color shall extend through full thickness. ; 78 inches minimum sheet width. ASTM F 2034, Type 1.
   1. RF1: Tarkett Linoleum Trentino XF2, 2.5 mm, Grey Pepper.
   2. RF2: Marmoleum Fresco, 2.5 mm, Dove Blue.

2.3 ACCESSORIES

A. Rubber Wall Base (WB1): ASTM F 1861 Type TS, Group 1: 0.125 inch thick, and 4 inches tall unless otherwise indicated. Basis of Design are as manufactured by Burke Flooring. Provide matching end stops.
   1. Resilient Flooring: Style B cove.
   2. Carpeting: Style A toeless.
   3. Color: As Scheduled in Drawings.

B. Transition Strips and Resilient Edges: Homogeneous rubber, tapered or bullnose edge, color to match flooring, or as selected by Architect from standard colors available; 0.125 inch thick, and not less than 1 inch wide.
   1. Adhesives (Cements): Waterproof, and stabilized; recommended by flooring manufacturer for material, substrate, and performance required. VCT Adhesive shall comply with RFCI ADH-1.
   2. Transition Strip: Schluter-RENO-U, provide for concrete to ceramic tile and VCT to ceramic tile transitions.

C. Installation Products:
   1. Leveling and Patching Compounds: Latex; product of flooring manufacturer.
   2. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
   3. Adhesives (Cements): Waterproof, and stabilized; recommended by flooring manufacturer for material and substrate, conductive where required.
   4. Welding Rod: Manufacturer’s multi-colored rod for each flooring pattern required.
   5. Vapor Emission Control: Compatible with the finish floor covering and installation materials required. Subject to Contractor's determination of methods to be utilized and compatibility with flooring, acceptable vapor emission control coatings utilizing two-component 100 percent solids epoxy technology or other chemistry complying with STM F 3010 may include products of Ardex, Koster, Sinak, Floor Seal Technology or approved.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify subfloor surfaces are free of characteristics, defects, and surface conditions that could impair flooring performance and appearance; start of installation will be interpreted as installer acceptance of conditions.
   1. Subfloor: Smooth, level, and sound; repair cracks and depressions, remove curing compounds, and coatings not compatible with flooring.

B. Preparation and Testing of Floors: Remove incompatible coatings and surface irregularities. Patch and level substrate as necessary. Establish final surface that will ensure optimum and durable mechanical and adhesive bonds for flooring.
   1. Perform pH, bond and moisture tests per ASTM F 710 and ASTM F 2170 with a sampling not less than one for every 800 to 1,000 square feet of installation area and determine compliance of substrate conditions with the floor manufacturer's requirements.
   2. Concrete surfaces shall be primed and otherwise treated in accordance with the finish flooring manufacturer's recommendations for the installation required by the Contract Documents.

C. Substrate Moisture Content and pH Level: Contractor responsibility to ensure that moisture content and pH level of bonding substrate at the time the flooring installation is scheduled to occur complies with the manufacturer's acceptable moisture emission limits and pH for floor covering and adhesive required when evaluated per ASTM F 710 and ASTM F 2170 or limits. In no case shall a pH level greater than 9.0 be acceptable.

D. Vapor Emission Control and pH Control: Contractor shall determine most effective method or combination of methods to achieve the required installation conditions. Contractor shall be responsible to provide means and methods to effectively establish the moisture and pH levels required for the finish flooring in compliance with the Construction schedule and per the approved Vapor Emission Control Plan at no additional cost to the Owner.

3.2 INSTALLATION

A. Provide complete coverage with uniform pattern and appearance throughout spaces indicated to receive flooring; cut, and fit to columns, walls, and obstructions; continue under modular casework, removable furnishings, extend into toe spaces, reveals, closets and similar openings; install flooring before movable partitions are erected.
   1. Where difference in finish floor surface is too small for standard reducer strips, use leveling compound to build-up substrate under thinner flooring; provide flush transition at finish surface.
   2. Mark finish surface with non-permanent markings for coordination of work subsequent to flooring installation.
   3. Install flooring under areas indicated to receive casework unless indicated otherwise in Drawings.
   4. Protect installed finish flooring as necessary to ensure at Project completion that it is without damage and deterioration due to subsequent construction activities.

B. Tightly adhere flooring to subbase free of cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and surface imperfections; hand roll each covered area to assure adhesion; ensure complete adhesion of edges and perimeter of flooring.

C. Minimize number of seams necessary, match edges for color, and pattern at seams; comply with manufacturer's recommendations.

D. Static Dissipative Flooring: Connect copper grounding strip to stranded ground wire; cut small recess into wall or floor and place grounding strip and ground wire into hole; bury connection in conductive adhesive filled to floor level or wall surface.

3.3 ACCESSORIES

A. Base: Longest lengths practicable for minimum number of joints in base. Throughout the length of each piece tightly bond base to substrate, with continuous contact at horizontal and vertical surfaces, free of cracks, voids, raising and puckering at joints. Fill voids between top edge of base and irregularities in vertical surfaces with manufacturer's recommended adhesive filler. Provide resilient base at the following locations except where integral cove base or another wall base type is specifically indicated.
   1. Intersection of resilient flooring and carpeted finish flooring with walls, columns, pilasters, and permanent fixtures as required.

3.4 CLEANING AND PROTECTION

A. Immediately upon completion of installation sweep or vacuum floor thoroughly; do not wash until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to form a permanent adhesive bond.
   1. Damp-mop floor being careful to remove dirt, surface marks and other foreign substances.
   2. Remove excess adhesive and surface blemishes using methods recommended by flooring manufacturers.

B. Protect flooring and prevent damage during construction period. Protective measures shall comply with resilient flooring manufacturer's directions. Provide approved temporary covering and protective panels and other suitable covering necessary to prevent wear and damage due to traffic, impact, heavy loads, abrasion by dirt and debris, and other construction activity.
   1. Sheet Flooring: Comply with manufacturer's recommendations for initial cleanup. Following initial cleanup, provide dry maintenance methods as recommended by the manufacturer.

C. Remove protection and clean flooring not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion.
   1. Clean flooring as recommended by flooring manufacturer. Do not use phenolic agents on sheet vinyl flooring.

3.5 FIELD QUALITY CONTROL

A. Field Testing of Walking Surface: Evaluated per ANSI B101.1 and ANSI B101.3; Static and Dynamic Coefficient of Friction not less than 0.42 and 0.35 respectively and qualifying as a National Floor Safety Institute high-traction surface for compliance with requirements.
   1. Testing Incidence: Not fewer than one test specimens for every 500 square feet and as otherwise necessary for a representative sampling per the test methodology
   2. Tribometer: Certified per ASTM F 2508

END OF SECTION

SECTION 09 68 13 – MODULAR CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for modular carpeting, walk off carpet tile and accessories.

B. Related Sections:
1. Section 01 81 13.17 Sustainable Design Requirements – CALGreen.
2. Section 09 05 00 Moisture Control Systems.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Conduct as necessary where complex patterns, unusual building geometry or other uncommon installation requirements pertain.

B. Schedule: Coordinate overall work sequence and Project schedule to allow the time necessary for substrate to cure and dry to within resilient flooring manufacturer's recommended moisture and pH levels as measured using the specified field tests without delay to the progress of the Work, and to allow completion of the Work within the Contract Time.
1. Contractor shall be responsible for achieving resilient floor manufacturer's required vapor pressure and pH requirements without delay to the Work and at no additional cost to the Owner.
2. Contractor shall coordinate scheduling of tests for moisture and pH levels to allow sufficient time for correction of non-compliant substrate conditions without delay to the finish floor installation and overall progress of the Work. Allow a minimum of 30 days prior to date scheduled for flooring installation in each work area.
3. Contractor shall be responsible for providing effective means to achieve the required installation conditions; these may include but are not necessarily limited to desiccant drying and associated temporary environmental controls, and vapor emission control treatments.

1.3 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CALGreen.”

B. CALIFORNA CODE OF REGULATIONS, TITLE 24, Part 2, California Building Coe (CBC), International Building Code with California Amendments.

C. Carpet and Rub Institute (CRI): CRI 104 – Standard for Installation of Commercial Carpet.

D. ASTM International standards and testing procedures as listed in this Section.

E. National Fire Protection Association (NFPA): NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Submit written data on physical characteristics, durability, resistance to fading, staining, and ignition characteristics.

B. CAL-Green Submittals:
   1. Product Data-VOC limits for adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents; comply with limits specified.
   2. Low Emitting Carpet: Provide verification that all carpet is certified CRI Green Lavbel Plus.

C. Shop Drawings: Carpet layout and direction, locations and types of edge strips.

D. Samples: Two tiles of each carpet required, and 6 inches length of linear accessories.

E. Contractor's Moisture Emission Control Plan: Provide as specified in Section 01 31 00 Project Coordination.

1.5 MAINTENANCE

A. Extra Materials: Provide 3 percent overrun of quantity calculated for Project in excess of that required for installation, waste and usable scraps; deliver wrapped and labeled, to Owner as directed.

1.6 PROJECT CONDITIONS

A. Environmental Requirements: Ambient temperature in installation space of 65 degrees F 48 hours prior to, during, and following installation; maintain ambient temperature of not less than 60 degrees thereafter; condition material in installation space for 48 hours prior to installation.
   1. Contractor shall be responsible for achieving manufacturer's required vapor pressure and pH requirements without delay to the Work and at no additional cost to the Owner.
   2. Contractor shall be responsible for providing effective means to achieve the required installation conditions; these may include but are not necessarily limited to desiccant drying and associated temporary environmental controls, and vapor emission control treatments.

B. Vapor Emission Control and pH Control: Contractor shall determine most effective method or combination of methods to achieve the required installation conditions. Contractor shall be responsible to provide means and methods to effectively establish the moisture and pH levels required for the finish flooring and in compliance with the Construction schedule at no additional cost to the Owner.

1.7 WARRANTY

A. Special Warranty: Provide written five years warranty, signed by Contractor, Installer and Manufacturer (Carpet Mill), agreeing to repair or replace defective materials and workmanship of carpeting work for five years following substantial completion.

B. Provide carpet manufacturer's written ten-year warranty of the following:

1. Retention of original tested static control valve.
2. Edge will not ravel under normal use.
3. Primary and secondary backings will not delaminate.
4. Stain resistance.
5. Dimensional Stability.

PART 2 - PRODUCTS

2.1 MANUFACTURED COMPONENTS

A. Performance Requirements:
1. VOC limits for adhesives, sealants, filler, primers, and coatings; comply with 01 81 13.17 Sustainable Design Requirements – CALGreen.
2. Carpet: Comply with Title 24, Part 11, 5.504.4.4; meet testing and product requirements of one of the following:
   a. Carpet and Rug Institute “Green Label Plus.”
   b. California Department of Public Health Standard Practice for testing of VOCs (Specification 01 350).
   c. NSF/ANSI 140 at Glod Level.
   d. Scientific Certification Systems Sustainable Choice.
   e. All carpet cushion installed to meet requirements of Carpet and Rug Institute “Green Label Program.”
   f. All carpet cushion installed to meet requirements of Title 24, Part 11, Table 5.504.4.1.
3. Flammability (Pill Test): ASTM D 2859, FRPT 0.22.
4. Radiant Panel Test: ASTM E 648; 0.25 rating or higher.
5. Surface Burning Characteristics: ASTM E 84; Flame Spread, 25; Smoke Developed, 50.
6. Smoke Density Test: ASTM E 662; 15.4 with flame, 9.1 without flame.
7. Fade Resistance: AATCC Test Method 16E; maximum gray scale factor of 4 for 40 hours test.
8. Electrical Properties
   a. Modular Carpet: AATCC 134; Not more than 3.0 KV resistance for 20 percent relative humidity at 70 degrees F.

B. CP1: Milliken Plato, 9 X 36-inch plank.
1. Color: Celestite.
2. Backing: Manufacturer’s standard WellBac cushion.

C. CP2: Milliken Grain Bias, 9 X 36-inch plank.
1. Color: Raw Edge.
2. Carpet Construction: Multi-level pattern loop.
3. Backing: Manufacturer’s standard WellBac cushion.

D. CP3: Milliken Plato, 9 X 36-inch plank.
1. Color: Bronze.
2. Backing: Manufacturer’s standard WellBac cushion.

E. CP4: Interface Social Fabric, 9 X 36-inch plank.
1. Color: Sunset.
2. Vinyl cushion backing with pre-applied adhesive.

F. CP5: Interstate Aquatint, 9 X 36-inch plank.
   1. Color: Carbon.
   2. Backing: Manufacturer’s standard WellBac cushion.

G. CP6 Walk-Off Carpet Tile: Milliken Cut/Strum.
   1. Color: Dark Grey.
   2. Backing: Manufacturer’s standard WellBac with Comfort Cushion and Traction Back per-applied adhesive.

H. CP7 Walk-Off Carpet Tile: Milliken CutX/Fizz.
   1. Color: Dark Green.
   2. Backing: Manufacturer’s standard WellBac with Comfort Cushion and Traction Back per-applied adhesive.

2.2 ACCESSORIES

A. Carpet Edge Guard: Extruded or molded heavy-duty rubber size and profile indicated, with minimum 2 inches wide anchorage flange; colors selected by Architect, coordinate with Section 09 65 00.

B. Rubber Wall Base: ASTM F 1861 Type TS, Group 1, Style A toeless; 0.125 inch thick, and 4 inches tall unless otherwise indicated. Provide matching end stops.

C. Miscellaneous Materials: As recommended by manufacturers of carpet, cushions and other carpeting products; and selected by Installer to meet project circumstance and requirements.
   1. Rubber Base: As required in Section 09 65 00.
   2. Vapor Emission Control: Compatible with the finish floor covering and installation materials required. Subject to Contractor's determination of methods to be utilized and compatibility with flooring, acceptable vapor emission control coatings may include products of Crete Seal, Floor Seal Technology, Sinak or approved.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify subfloor surfaces are free of characteristics, defects, and surface conditions that could impair carpet performance and appearance; do not proceed until unsatisfactory conditions have been corrected.
   1. When directed have manufacturer's qualified technical representative examine subfloor and advise installer of methods necessary to correct conditions that may impair carpet performance and appearance.

B. Prepare and clean subfloor surfaces as recommended by manufacturer's technical representative. Remove existing flooring and noncompatible coatings.
   1. Subfloor: Smooth, level, and sound; repair cracks, depressions, and surface imperfections that may telegraph.

C. Preparation and Testing of Floors: Remove incompatible coatings and surface irregularities. Patch and level substrate as necessary. Establish final surface that will ensure optimum and durable mechanical and adhesive bonds for flooring.

1. Perform pH, bond and moisture tests per ASTM F 710 and ASTM F 2170 with a sampling not less than one for every 800 to 1,000 square feet of installation area and determine compliance of substrate conditions with the floor manufacturer's requirements.
2. Concrete surfaces shall be primed and otherwise treated in accordance with the finish flooring manufacturer's recommendations for the installation required by the Contract Documents.

D. Substrate Moisture Content and pH Level: Contractor responsibility to ensure that moisture content and pH level of bonding substrate at the time the flooring installation is scheduled to occur complies with the manufacturer's acceptable moisture emission limits and pH for floor covering and adhesive required when evaluated per ASTM F 710 and ASTM F 2170 or limits. In no case shall a pH level greater than 9.0 be acceptable.

E. Vapor Emission Control and pH Control: Contractor shall determine most effective method or combination of methods to achieve the required installation conditions. Contractor shall be responsible to provide means and methods to effectively establish the moisture and pH levels required for the finish flooring and in compliance with the Construction schedule at no additional cost to the Owner.

3.2 INSTALLATION

A. Provide complete coverage with uniform pattern and appearance, throughout spaces indicated to receive carpeting; cut, and fit to permanent fixtures, built-in furniture, columns, walls, and obstructions; extend under open-bottomed obstructions, removable flanges, into toe spaces, reveals, closets, and similar openings; install flooring before movable partitions are erected.
1. Provide cut-outs where required, bind cut edges properly where not concealed by protective edge guards or overlapping flanges.
2. Install carpet edge guard where edge of carpet is exposed; anchor guards to substrate.
3. Expansion Joints: Do not bridge building expansion joints with continuous carpeting, provide for movement.

B. Walk-Off Entrance Matt: Comply with installation requirements for modular carpet and barrier free design requirements of ANSI A 117.1 for accessible floor surfaces transitions and similar requirements

3.3 CLEANING AND PROTECTION

A. Vacuum carpet using commercial machine with HEPA filter. Remove spots and replace carpet where spots cannot be removed. Remove any protruding face yarn using sharp scissors.

B. Advise Contractor of protection methods and materials needed to ensure that carpeting will be without deterioration or damage at time of substantial completion.

END OF SECTION

SECTION 09 81 00 – ACOUSTICAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for insulation to be incorporated in select locations of wall and ceiling assemblies for control of sound or other non-thermal performance.

B. Submittals:
1. Product Data: Include instructions for use and maintenance.
2. Shop Drawings: Show installation and mounting of insulation, indicate required trim and accessories, field verified measurements.
3. Samples: When directed provide two of each finish and type.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Glass Fiber Insulations: Formaldehyde free and contain a minimum 25 percent of recycled material, ASTM E 84 flame spread 25, and smoke development 50 rating, and comply with individual product specifications.
1. Fiberglass Batts: Owens Corning Pink Next Gen Fiberglas Sound Attenuation Batts (SAB) Metal Framing,
   a. Owens Corning Select Sound Black Acoustic Blanket, Knauf EcoBatt or approved provide black facing for batts exposed to view in completed installation.
2. Fiber Glass Board: Owens Corning Select Sound Black Acoustic Board Knauf Black Acoustical Board or approved.
3. Acoustical Liner: ASTM C 1071 Type I flexible, Class A, 2 inches thick having a Noise Reduction Coefficient of 0.95 evaluated per ASTM C 423 Mounting A; finish, black matt face. Owens Corning QuietR Duct Liner Board, Rotary Duct Liner or approved.

B. Mineral Wool: with a nominal aged R-value per inch not less than 4 suitable for the applications required.
1. Rigid or Semi-rigid Board: ASTM C 612 Type IV Roxul ConRock, Roxul RockBoard or Owens Corning Thermafiber VersaBoard; thickness indicated, unfaced except units exposed to view in completed installation shall have white or black facing as directed.
2. Fire Safing & Curtain Wall Spandrel Insulation: ASTM C 612 Type IV, pass ASTM E 136, Class 4 semi-rigid batts Roxul Safe, Thermafiber FireSpan.
3. Batt or Blanket: ASTM C 665 Type 1 Roxul Safe or Comfort Batt or Thermafiber UltraBatt.

C. Acoustic Backing Scrim: Provide at perforated panels as required. Non-woven, sound absorbing, fire resistive black fabric with heat-sensitive adhesive intended for backing of perforated panels. Pyrotek Sobertextile P44FR or approved.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Extend insulation in thickness indicated, and as necessary to comply with require performance values over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

B. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

C. Acoustic Ceiling Insulation: Coordinate with work of Sections 09 54 13, 09 54 26 and 09 54 34 and provide perimeter trim components as indicated. Provide adhesive application to concrete deck between slotted channels to support building services.
   1. Provide field verified dimensions for custom size panels required.

END OF SECTION

SECTION 09 83 13 – ACOUSTICAL WALL TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes demountable acoustical wall panel systems and decorative, modular fin-and-slab acoustical wall panel.

B. Submittals:
   1. Product Data: Required for ceiling panels, suspension systems, and accessories; including maintenance instructions.
   2. Samples: Color, finish and type required; 12 inches square of ceiling panels, and 12 inches length of suspension systems.
   3. Three-dimensional image file proof for Owner acceptance, illustrating AWP-4 custom pattern in color(s) selected.
   4. Certificates: Indicating compliance with Performance Requirements.

C. Project Requirements: Install panels in enclosed, weatherproof spaces maintained at approximately same humidity and temperature as planned for occupancy.

PART 2 - PRODUCTS

2.1 MANUFACTURED COMPONENTS

A. Absorptive Acoustic Wall Panel: ASTM E 84 Class A sound-absorptive wall panels as follows:
   1. FA6: Soelberg Muto 100% PET, polyester felt.
      a. Size: Panel and overall installation sizes as shown.
      b. NRC: 0.35 or greater.
      c. Edge detail: TBD.
      d. Installation: Per Manufacturer’s instructions.
      e. Color: Lamb’s Ear.

B. Accessories: Mechanical fasteners, clips, hangers, splines, and attachment components as required by manufacturer for installation required.
   1. Attachment Clips: Interlocking Z cleats, Brooklyn Hardware or as recommended by manufacturer for warranty installation.
   2. Adhesive: Contact adhesive as recommended by panel manufacturer for size and substrate indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wall treatments plumb, in configurations and alignment required, cut and fit to contours, and obstructions as required; provide tight joints, and concealed anchorage unless otherwise indicated; comply with manufacturer's instructions.

1. Unless otherwise indicated, arrange units symmetrically on each wall, do not use less than half size units.
2. Install accessories and fasteners as recommended by manufacturer.

END OF SECTION

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
   1. Concrete, stucco, cement plaster and masonry other than CMU.
   2. Ferrous metal.
   3. Zinc-coated (galvanized) metal.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches square.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.
   5. Draw-Down Samples: Provide three (3) "draw-down" samples of each specified sheen, color and finish.
   6. Prepare samples of wood for selection of tone and finish by Architect.

C. Product List: For each product indicated, include the following:

D. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
   1. VOC content.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

B. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product by color and finish was used, product data pages, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
   a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
   b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
   a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
   1. Dunn-Edwards Corporation.

B. Products: Subject to compliance with requirements, provide one of the products listed in "Exterior Painting Schedule" article in Part 3 below for the paint category indicated or an acceptable comparable product.

2.2 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings.
   1. Comply with California Breen Building Standards Code Title 24, Part 11 (CALGreen) 5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards:
      a. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168

VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

b. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

B. VOC Content: Provide products equal to or less than emission limits emanating from paints and coatings that do not result in building air concentrations greater than limits specified below when tested using Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emission from Indoor Sources Using Environmental Chambers Version 1.1 (2010), http//www.cal-iaq.org/vocs/standard-method-for-voc-emissions-testing-and-evaluation.
Provide testing data current within 12 months preceding submission specified in Submittals article in Part 1 of this Section. Comply with the requirements South Coast Air Quality Management District (SCAQMD) Rule 1113 and 1168.

a. Emission Limits:
   1) Formaldehyde: 7.3 ppb.
   2) TVOC: 0.5 mg/cubic meter.
   3) Total Aldehydes: 43 ppb.

C. Carcinogen Limits: Include in Submittal listing of measured carcinogens and reproductive toxins Identified by California 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (ARC). Ensure any pollutants in paints and coatings not listed comply with the following:

1. Air concentration levels no greater than 1/100 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Governmental Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4436).
2. Air concentration level not greater than 1/2 CA Chronic Reference Exposure Level (CREL) (http://www.oehha.ca.gov/air/allchrels.html) adopted by State of California Office of Environmental Health Hazard Assessment (OEHHA) as required per State of CA DPH's CDPH/EHLB/Standard Method V1.1 "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emission from Indoor Sources Using Environmental Chambers Version 1.1" dated February 2010, Table 4-1.

2.3 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As indicated in a color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Concrete: 12 percent.
   2. Masonry (Clay and CMU): 12 percent.
   3. Wood: 15 percent.
   4. Portland Cement Plaster: 12 percent.
   5. Gypsum Board: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations and MPI Architectural Painting Specification Manual as applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
   1. SSPC-SP 3, "Power Tool Cleaning."

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

H. Wood Substrates:
1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations.
1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed to view:
a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Concrete, Stucco, Cement Plaster and Masonry (Other than Concrete Masonry Units):
   1. Flat Sheen:
      a. Dunn-Edwards Corporation:
         1) Primer: DE EFF Stop Select ESSL00 Primer.
         2) First and Second Coats: DE Spartashield SSHL10 Flat Paint.
   2. Semi-Gloss Sheen:
      a. Dunn-Edwards Corporation:
         1) Primer: DE EFF Stop Select ESSL00.
         2) First and Second Coats: DE Spartashield SSHL50 Semi-Gloss.

B. Exterior Gypsum Soffit Board:
   1. Dunn-Edwards Corporation:
      a. Primer: DE Ultra Grip UGPR00 Primer.
      b. First and Second Coats: DE Spartashield SSHL10 Flat Paint.

C. Smooth Wood (Painted):
   1. Flat Sheen:
      a. Dunn-Edwards Corporation:
         1) Primer (Unfinished Surfaces): DE EZ Prime Wood Primer EZPR00.
         2) First and Second Coats: DE Spartashield SSHL10 Flat Paint.
   2. Low-Luster, Satin, or Eggshell Sheen:
      a. Dunn-Edwards Corporation:
         1) Primer (Unfinished Surfaces): DE EZ Prime Wood Primer EZPR00.
         2) First and Second Coats: DE Spartashield Eggshell SSHL30 Paint.
   3. Semi-Gloss Sheen:

a. Dunn-Edwards Corporation:
1) Primer (Unfinished Surfaces): DE EZ Prime Wood Primer EZPR00.
2) First and Second Coats: DE Spartashield SSHL50 Semi-Gloss.

D. Rough Wood (Solid Color):
1. Acrylic Latex Systems: Two coats.
a. Dunn-Edwards Corporation: Dunn Edwards Solid Color Deck, Fencing & Siding Stain STSE10.
b. Dunn-Edwards Corporation: Cabot Solid Color Decking Stain 1800 Series.

E. Stained Wood:
1. Acrylic Latex Systems (Semi-Transparent): Two coats.
a. Dunn-Edwards Corporation: Cabot Tintable Wood Preservative 4300.
b. Dunn-Edwards Corporation: Cabot Wood Tintable Preservative 4800 Series.

F. Ferrous Metal:
1. Semi-Gloss Sheen:
a. Dunn-Edwards Corporation:
1) Primer (Unpainted Surfaces): Enduraprime Acrylic Rust Preventive Primer ENPR00.
2) First and Second Coats: DE Aristoshield W/B Urethane Alkyd Semi-Gloss ASHL50..

1. Full Gloss Sheen:
b. Dunn-Edwards Corporation:
1) Primer (Unpainted Surfaces): Enduraprime Acrylic Rust Preventive Primer ENPR00.
2) First and Second Coats: Aristoshield W/B Urethane Alkyd Gloss ASHL 70.

G. Zinc-Coated (Galvanized) Metal:
1. Semi-Gloss Sheen:
a. Dunn-Edwards Corporation:
1) Primer: Ultra-Shield Galvanized Primer ULGM00.
2) First and Second Coats: DE Spartashield SSHL50 Semi-Gloss.
2. Full Gloss Sheen:
a. Dunn-Edwards Corporation:
1) Primer: DE Ultrashield Galvanized Primer ULGM00 Primer.
2) First and Second Coats: Aristoshield W/B Urethane Gloss ASHL70.

H. Wood Panel Substrates (Satin):
1. Dunn-Edwards Corporation:
a. Primer: DE EZ PRIME Wood Primer EZPR00.
b. First and Second Coats: DE Spartashield SSHL30 Eggshell Acrylic Finish.
2. Dunn-Edwards Corporation:
a. Primer: DE Rustoleum Porch and Floor Enamel SATIN Finish “ (Smooth or Slip Resistant Formula).
b. First and Second Coats: DE Rustoleum Porch and Floor Enamel SATIN Finish ““ (Smooth or Slip Resistant Formula).

END OF SECTION 09 91 13

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on [interior substrates.] [the following interior substrates:]
   1. Concrete.
   2. Steel.
   3. Cast iron.
   4. Galvanized metal.
   5. Wood.
   6. Gypsum board.
   7. Plaster.
   8. PVC Piping.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
   1. Include documentation indicating that product contains no urea formaldehyde in compliance with California Air Resources Board (CARB) regulations.
   2. For paints and coatings, including printed statement of VOC content.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.
   5. Draw-Down Samples: Provide 3 "draw-down" samples of each specified sheen, color and finish.
   6. Prepare samples of wood for selection of tone and finish by Architect.

C. Product List: For each product indicated, include the following:
   1. Cross-reference to paint system and locations of application areas. Use seam designations indicated on Drawings and in schedules.
   2. VOC content.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Materials: Furnish extra materials[, from the same product run,] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each materials and color applied.

B. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product by color

and finish was used, product data pages, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockup unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Storage: Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
   2. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point, or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Dunn Edwards.

B. Products: Subject to compliance with requirements, provide one of the products listed in "Interior Paint Schedule" article in Part 3 below for the paint category indicated or an acceptable comparable product.

2.2 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings.
1. Comply with California Green Building Standards Code Title 24, Part 11 (CALGreen) 5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards:
a. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.
b. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

B. VOC Content: Provide products equal to or less than emission limits emanating from paints and coatings that do not result in building air concentrations greater than limits specified below when tested using Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emission from Indoor Sources Using Environmental Chambers Version 1.1 (2010), http//www.cal-iaq.org/vocs/standard-method-for-voc-emissions-testing-and-evaluation.
Provide testing data current within 12 months preceding submission specified in Submittals article in Part 1 of this Section. Comply with the requirements South Coast Air Quality Management District (SCAQMD) Rule 1113 and 1168.
a. Emission Limits:
1) Formaldehyde: 7.3 ppb.
2) TVOC: 0.5 mg/cubic meter.
3) Total Aldehydes: 43 ppb.

C. Carcinogen Limits: Include in Submittal listing of measured carcinogens and reproductive toxins Identified by California 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (ARC). Ensure any pollutants in paints and coatings not listed comply with the following:
1. Air concentration levels no greater than 1/100 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Governmental Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4436).
2. Air concentration level not greater than 1/2 CA Chronic Reference Exposure Level (CREL) (http://www.oehha.ca.gov/air/allchrels.html) adopted by State of California Office of Environmental Health Hazard Assessment (OEHHA) as required per State of CA DPH's CDPH/EHLB/Standard Method V1.1 "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emission from Indoor Sources Using Environmental Chambers Version 1.1" dated February 2010, Table 4-1.

2.3 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As indicated in a color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
2. Wood: 15 percent.
3. Gypsum Board: 12 percent.
4. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Plaster Substrates: Verify that plaster is fully cured.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers

F. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations and MPI Architectural Painting Specifications Manual as applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and re-prime substrate with compatible primers or apply the coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
1. SSPC-SP 3, "Power Tool Cleaning."

B. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed areas.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently-applied paints.

G. Wood Substrates:
1. Scrape and clean knots and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view and dust off.
3. Prime edges, ends, face, under sides, and back sides of wood.
4. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filer. Sand smooth when dried.

H. Cotton or Canvas Insulation Covered Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

I. PVC Piping: Remove dust, dirt, clear coat and other material that may impair bond of paint.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
   1. Paint the following work where exposed in equipment rooms:
      a. Equipment, including panel boards.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Tanks that do not have factory-applied finishes.
      h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or another paintable jacket material.
   2. Paint the following work where exposed in occupied spaces:
      a. Equipment, including panel boards.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or another paintable jacket material.
      h. Other items as directed by Architect.
   3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces with paint complying with following requirements as labeled by approved testing laboratory to:
      a. Have flame spread rating of 25 or less and smoke developed rating of 50 or less when tested in accordance with ASTM E 84.
      b. Not flame, glow, smolder, or smoke when tested in accordance with ASTM C411 at rated temperatures not less than 250 degrees F.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage services of qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint applications, clean spattered surfaces. Remove spattered pains by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry Other Than Concrete Masonry Units:
1. Flat Sheen:
a. Dunn Edwards:
1) Primer (Unpainted Surfaces): Ultra-Grip Select UGSL00.
2) First and Second Coats: SpartaZero Zero VOC Flat Paint SZRO10.
2. Low-Luster, Satin, or Eggshell Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: SpartaWall Zero VOC Eggshell Paint SWLL30.
3. Semi-Gloss Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: SpartaWall Zero VOC Semi-Gloss Paint SWLL50.

B. Gypsum Board:
1. Flat Sheen:
a. Dunn Edwards:
1) Primer: Vinylastic Select Zero VOC Wall Sealer VNSL00.
2) First and Second Coats: Spartazero Zero VOC Flat Paint SZRO10.
2. Low-Luster, Satin, or Eggshell Sheen:
a. Dunn Edwards:
1) Primer: Vinylastic Select Zero VOC Wall Sealer VNSL00.
2) First and Second Coats: SpartaWall Zero VOC Eggshell SWLL30.
3. Semi-Gloss Sheen:
a. Dunn Edwards:
1) Primer: Vinylastic Select Zero VOC Wall Sealer VNSL00.
2) First and Second Coats: SpartaWall Zero VOC Semi-Gloss SWLL50.
4. Full-Gloss Sheen:
a. Dunn Edwards:
1) Primer: Vinylastic Select Zero VOC Wall Sealer VNSL00.
2) First and Second Coats: Spartashield 100% Acrylic Gloss.

C. Plaster:
1. Flat Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartazero Zero VOC Flat Paint SZRO10.
2. Satin, Low-Luster, or Eggshell Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartawall Zero VOC Eggshell SWLL30.
2. Semi-Gloss Sheen:
b. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartawall Zero VOC Semi-Gloss SWLL50.
3. Full Gloss Sheen:

a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartashield 100% Acrylic Gloss SSHLL60.

D. Woodwork and Hardboard Painted:
1. Satin or Eggshell Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartawall Zero VOC Eggshell SWLL30.
2. Semi-Gloss Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartawall Zero VOC Semi-Gloss SWLL50.
3. Full Gloss Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
2) First and Second Coats: Spartashield 100% Acrylic Gloss SSHL60.

E. Mechanical and Electrical Items: Use 3-coat system best suited to substrate, satin finish. Use heat-resistant materials where required.

F. Ferrous Metal:
1. Flat Sheen:
a. Dunn Edwards:
1) Primer: Enduraprime W/B Rust Preventive Primer ENPR00.
2) First and Second Coats: Spartazero Zero VOC Flat Paint SZRO10.
2. Satin or Eggshell Sheen:
a. Dunn Edwards:
1) Primer: Enduraprime W/B Rust Preventive Primer ENPR00.
2) First and Second Coats: Spartawall Zero VOC Eggshell Paint SWLL30.
3. Semi-Gloss Sheen:
a. Dunn Edwards:
1) Primer: Enduraprime W/B Rust Preventive Primer ENPR00.
2) First and Second Coats: Spartawall Zero VOC Semi-Gloss SWLL50.
4. Gloss Sheen:
a. Dunn Edwards:
1) Primer: Enduraprime W/B Rust Preventive Primer ENPR00.
2) First and Second Coats: Spartashield 100% Acrylic Gloss SSHL60.

G. Zinc-Coated (Galvanized) Metal:
1. Flat Sheen:
b. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGPR00.
2) First and Second Coats: Spartazero Zero VOC Flat Paint SZRO10.
2. Satin or Egg-Shell Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGPR00.
2) First and Second Coats: Spartawall Zero VOC Eggshell Paint SWLL30.
3. Semi-Gloss Sheen:
a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGPR00.
2) First and Second Coats: Spartawall Zero VOC Semi-Gloss SWLL50.
4. Full-Gloss Sheen:

a. Dunn Edwards:
1) Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGPR00.
2) First and Second Coats: Spartashield 100% Acrylic Gloss SSHL60.

H. Overhead Exposed Construction (Deck, Joists, Steel): Two coats flat dry fallout coating system to cover formulated for compatibility with all substrate by any paint manufacturer specified in this Section. Use 100 percent acrylic, flash-rust-resistance dryfall.
1. Dunn Edwards: Aquafall Flat Dry Fall Paint AQUA10.

I. Wood Fiber Acoustical Panels (Eggshell): One coat.
1. Dunn Edwards: Aquafall Flat Dry Eggshell Paint AQUA30.

J. Exposed PVC Piping:
1. Dunn Edwards:
a. Primer: Ultra-Grip Select Zero VOC Multi-Surface Primer UGSL00.
b. First and Second Coats: Spartashield 100% Acrylic Gloss SSHL60.

3.7 PAINT COLOR AND GLOSS SCHEDULE

A. Paint Colors: Using products approved for each paint system provide colors matching each of the following. Number designates product of Dunn-Edwards Paint unless otherwise specified; provide Eggshell unless otherwise indicated; Provide Semi-Gloss at Doors, Trim and Restrooms; Provide Flat at Ceilings.
1. PT1: DE_TBD, LRV XX.
2. PT2: DE_TBD, LRV XX.
3. PT3: DE_TBD, LRV XX.
4. PT4: DE_TBD, LRV XX.
5. PT5: DE_TBD, LRV XX.
6. PT6: DE_TBD, LRV XX.
7. PT7: DE_TBD, LRV XX.
8. PT8: DE_TBD, LRV XX.
9. PT9: DE_TBD, LRV XX.
10. PT10: DE_TBD, LRV XX.

END OF SECTION 09 91 23

SECTION 09 96 00 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:
   1. Exterior Substrates:
      a. Steel.
      b. Galvanized metal.
      c. Portland cement plaster (stucco).
      d. Aluminum.
   2. Interior Substrates:
      a. Steel.

1.2 DEFINITIONS

A. Gloss Level 5: 35 to 79 units at 60 degrees, according to ASTM D 523.

B. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

C. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
   1. Include documentation indicating that product contains no urea formaldehyde in compliance with California Air Resources Board (CARB) regulations.
   2. For paints and coatings, including printed statement of VOC content.

B. Provide submittals for PBT Source Reduction for Lead, Cadmium, and Copper.

C. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.
   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Apply coats on Samples in steps to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

D. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Coatings: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product by color and finish was used, product data pages, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each coating system.
      a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
   1. Benjamin Moore & Co.

2. Corotech Coatings; Benjamin Moore & Co.
3. PPG ArchitecturalCoatings, PPG Paints.
4. Sherwin-Williams Company (The).
5. Tnemec Company, Inc.

B. Products: Subject to compliance with requirements, provide one of the products listed in the Exterior High-Performance Coating Schedule or Interior High- Performance Coating Schedule for the coating category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
3. Products shall be of same manufacturer for each coat in a coating system.

B. Performance Requirements:
1. Comply with California Green Building Standards Code Title 24, Part 11 (CalGreen):
a. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.
2. Provide products equal to or less than emission limits emanating from paints and coatings that do not result in building air concentrations greater that limits specified below when tested using Standard Method for the Testing and Evaluation of Volatile Organic Chemical emission from Indoor Sources Using Environmental Chambers Version 1.1 (2010), http//www.cal-iaq.org/vocs/standard-method-for-voc-emissions-testing-and- evaluation. Provide testing data current within12 months preceding submission specified in Submittals Article in Part 1 of this Section.
a. Emission Limits:
1) Formaldehyde: 7.3 ppb.
2) TVOC: 0.5 mg/cubic meter.
3) Total Aldehydes: 43 ppb.
b. Include in submittal listing of measured carcinogens and reproductive toxins identified by California 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC). Ensure any pollutants in paints and coatings not listed comply with the following:
1) Air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial workplace standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D07, Cincinnati, Ohio 45211-4438).
2) Air concentration level no greater than 1/2 CA Chronic reference Exposure Level (CREL) (http://www.oehha.ca.gov/air/allchrels.html) adopted by State of California Office of Environmental Health Hazard Assessment (OEHHA) as "Standard Method for the Testing and

Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers Version 1.1" Dated February 2010, Table 4.1.

C. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Material Emissions and Pollutant Control: Not less than 85 percent of field-applied paints and coatings that are inside the weatherproofing system shall comply with either of the following:
1. Low-Emitting Materials: VOC emissions shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
2. VOC content shall not exceed limits of authorities having jurisdiction and the following:
   a. Flat Coatings: 50 g/L.
   b. Nonflat Coatings: 100 g/L.
   c. Nonflat - High-Gloss Coatings: 150 g/L.
   d. Concrete/Masonry Sealers: 100 g/L.
   e. Floor Coatings: 100 g/L.
   f. Industrial Maintenance Coatings: 250 g/L.
   g. Low-Solids Coatings: 120 g/L.
   h. Mastic Texture Coatings: 100 g/L.
   i. Metallic Pigmented Coatings: 500 g/L.
   j. Pretreatment Wash Primers: 420 g/L.
   k. Primers, Sealers, and Undercoaters: 100 g/L.
   l. Reactive Penetrating Sealers: 350 g/L.
   m. Recycled Coatings: 250 g/L.
   n. Rust-Preventive Coatings: 250 g/L.

E. Emissions Requirements: Field-applied paints and coatings that are inside the weatherproofing system shall comply with either of the following:
1. Low-Emitting Materials: VOC emissions shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
2. VOC content shall not exceed limits of authorities having jurisdiction and the following:
   a. Flat Coatings: 50 g/L.
   b. Nonflat Coatings: 100 g/L.
   c. Primers, Sealers, and Undercoats: 100 g/L.
   d. Floor Coatings: 100 g/L.
   e. Shellacs, Clear: 730 g/L.
   f. Shellacs, Pigmented: 550 g/L.

F. VOC Emissions: For field applications inside the building, wall paints shall contain no more than half of the chronic REL of VOCs when tested according to the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit or 33 mcg/cu. m and that of acetaldehyde shall not exceed 9 mcg/cu. m.

G. Colors: Match Architect's samples.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Plaster: 12 percent.

C. Plaster Substrates: Verify that plaster is fully cured.

D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

B. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

C. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer[**.**][**but not less than the following:**]
   1. SSPC-SP 7/NACE No. 4.
   2. SSPC-SP 11.
   3. SSPC-SP 6/NACE No. 3.
   4. SSPC-SP 10/NACE No. 2.
   5. SSPC-SP 5/NACE No. 1.

D. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.

F. Aluminum Substrates: Remove loose surface oxidation.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual." including, but not limited to, manufacturer's instructions and recommendations for safety and ventilation.
   1. Use applicators and techniques suited for coating and substrate indicated.
   2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
   4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

C. Do not allow excess time to elapse following application of epoxy type coatings, as determined by the manufacturer; document manufacturer's recommendation for the Architect's information.

D. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

E. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

G. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
   1. Contractor shall touch up and restore coated surfaces damaged by testing.
   2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates: Exposed structural [canopy steel] [and] [angle lintels and hung plate] substrates[; steel deck plates]:
   1. Pigmented Polyurethane Over Zinc-Rich Primer System:
      a. Corotech:
         1) Prime Coat: Corotech Organic Zinc Rich Primer V170.
         2) Intermediate Coat: Corotech Aliphatic Acrylic Urethane Coating Gloss V500.
         3) Topcoat: Corotech Aliphatic Acrylic Urethane Coating Gloss V500.
      b. PPG Paints:
         1) Prime Coat: Carbozinc 859 Series.
         2) Intermediate Coat: Carboguard 890 Series.
         3) Topcoat: Carbothane 134 Series.
      c. Sherwin-Williams Company:
         1) Prime Coat: S-W Zinc Clad III HS100, B69.
         2) Intermediate Coat: S-W Macropoxy 646-100 Fast Cure Epoxy, B58.
         3) Topcoat: S-W Acrolon 100 WB Polyurethane, B65.
      d. Tnemec Company, Inc.:
         1) Prime (Shop) Coat: Series 94H2O Hydro Zinc. Refer to applicable Division 05 Section.
         2) Intermediate Coat: Series 27 W.B. Typoxy.
         3) Topcoat Semi-Gloss: 1081 Endura-Shield.
         4) Topcoat Semi-Gloss: Advanced Technology Modified Polycarbide Series 750 UVS.
         5) Topcoat Semi-Gloss: Gold Standard Flouropolymer Series 1071.
         6) Topcoat Gloss: 1080 Endur-Shield.
         7) Topcoat Gloss: Advanced Technology Modified Polycarbide Series 740.
         8) Topcoat Gloss: Gold Standard Flouropolymer Series V1070.

B. Galvanized-Metal Substrates:
   1. Pigmented Polyurethane Over Epoxy Primer System:
      a. Corotech:
         1) Prime Coat: Corotech Waterborne Bonding Primer V175.
         2) Intermediate Coat: Corotech Aliphatic Acrylic Urethane Coating Gloss V500.
         3) Topcoat: Corotech Aliphatic Acrylic Urethane Coating Gloss V500.

b. PPG Paints:
1) Prime Coat: Carbomastinc 15.
2) Intermediate Coat: Carbomastinc 15.
3) Topcoat: Carboxane 2000 or 2100 FC.
c. Sherwin-Williams Company:
1) Prime Coat: S-W Macropoxy 646-100 Fast Cure Epoxy, B58.
2) Intermediate Coat: Acrolon 100 WB Polyurethane, B65.
3) Topcoat Gloss: Acrolon 100 WB Polyurethane, B65.
d. Tnemec Company, Inc.:
1) Prime Coat: Series 27 W.B. Typoxy.
2) Intermediate Coat: Series 27 W.B. Typoxy.
3) Topcoat Semi-Gloss: 1081 Endura-Shield.

C. Portland Cement Plaster Substrates:
1. Epoxy System MPI EXT 9.1D:
a. Prime Coat: Epoxy, matching topcoat.

b. Intermediate Coat: Epoxy, matching topcoat.
c. Topcoat: Epoxy, gloss, MPI #77.

D. Aluminum (Not anodized or otherwise coated) Substrates:
1. Epoxy System MPI EXT 5.4E.
a. Prime Coat, vinyl wash (MPI #80).
b. Intermediate Coat: Epoxy matching Topcoat.
c. Topcoat: Epoxy, gloss (MPI #77).

3.7 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:
1. Pigmented Polyurethane Over Epoxy Zinc-Rich and Epoxy System: High contact/high traffic areas such as, but not limited to, doors, frames, pipes, etc.
a. Corotech:
1) Prime Coat: Corotech Organic Zinc Rich Primer V170.
2) Intermediate Coat: Corotech Polyamide Epoxy Primer V150.
3) Topcoat Gloss: Corotech Aliphatic Acrylic Urethane Coating Gloss V500.
4) Topcoat Semi-Gloss: Corotech Aliphatic Acrylic Urethane Coating Semi-Gloss V510.
b. PPG Paints:
1) Prime Coat: Carbozinc 859 Series.
2) Intermediate Coat: Carboguard 890 Series.
3) Topcoat: Carbothane 134 Series.
c. Sherwin-Williams Company:
1) Prime Coat: S-W Zinc Clad III HS100, B69.
2) Intermediate Coat: S-W Macropoxy 646-100 Fast Cure Epoxy, B58.
3) Topcoat: S-W Acrolon 100 WB Polyurethane, B65.
d. Tnemec Company, Inc.:
1) Prime (Shop) Coat: Series 94H2O Hydro-Zinc. Refer to applicable Division 05 sections.
1) Intermediate Coat: Series 287 Enviro-Pox.
2) Topcoat Semi-Gloss: Series 248 Clear Everthane.
3) Topcoat Gloss: Series 297 Enviro-Glaze.

END OF SECTION 09 96 00

SECTION 10 11 00 – MARKERBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for wall mounted glass markerboards.

1.2 SUBMITTALS

A. Product Data: Include instructions for use and maintenance.

B. Shop Drawings: Show installation and mounting of glass markerboards, including accessories, indicate field measurements.
1. Indicate size and configuration of boards required, include accessory components.
2. Demonstrate coordination of backing and blocking in wall framing with accessories and mounting clips.

C. Samples: Two of each finish and type, as directed by Architect; 12 inches square.

1.3 PROJECT CONDITIONS

A. Field Measurements: As necessary for installation of boards as required.

1.4 WARRANTY

A. Special Warranty: Written, signed by manufacturer; agree to replace glass markerboards that do not retain their original writing and erasing qualities, including chipping, break outs, cracking, or pitting, or are otherwise defective, for the lifetime of the installation.

PART 2 - PRODUCTS

2.1 MANUFACTURED COMPONENTS

A. Wall Mounted Glass Markerboard: Basis of Design is Claridge Products Claridge Glass Wall-Mounted Markerboard.
1. Glass: ¼-inch Low-Iron Ultra-Clear Magnetic Glass.
2. Mounting: Manufacturer’s standard Invisi-mount dual lock assembly.

B. Fabricate boards to sizes shown in Drawings. Complete fabrication in factory, including application of trim and finishes; disassemble only as necessary for shipping and installation.
1. Complete fabrication in factory, including application of trim and finishes; disassemble only as necessary for shipping and installation.
2. Writing Surface Color: Brilliant White or as selected by Architect from manufacturer’s standard color options.
3. Modify and reinforce manufacturer's standard support system as necessary for board sizes and installations required.

C. Accessories: Fore each board, provide:
   1. Magnetic Microfiber Eraser Cloth: (2) Two 12-inch by 12-inch eraser cloths with magnet required.
   2. Magnetic Eraser: (2) 2-1/*-inch by 4 ½" erasers required; color as selected by Architect from manufacturer's options.
   3. Markers: Provide two (2) assorted marker four-packs.
   4. Magnets: Provide four (4) rare earth magnets for each board provided, Basis of Design is Calyx Rare Earth Magnets, 1.29 x 1.29 inches square, in standard color as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install glass boards as required; plumb and true with surfaces of adjacent boards flush and aligned. Maintain perimeter edges straight, plumb and level.
   1. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim and accessories necessary for installation as required.

B. Verify that accessories required for each unit have been properly installed and that operating units function properly.

C. Clean units in accordance with the manufacturer's instructions. Break-in glass marker boards only as recommended by the manufacturer.

END OF SECTION

SECTION 10 14 00 – INTERIOR SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for code required signage, room and stair identification and rest room signage as specified and as scheduled.

B. Related Sections:
1. Section 10 44 50 Sign Illustrations and Graphic Layout.

1.2 SUBMITTALS

A. Product Data: For each type of sign required.

B. Shop Drawings: Details of sign fabrication and installation not adequately described by product data.

C. Proof Sheets: Complete typographic alphabets for each typeface and weight required include origin of typeface library.

D. Templates: Full size, for coordination of anchors and inserts in other construction, and surface mounted letters.

E. Samples:
1. Material and Component Samples: Two of each exposed material, one foot square or one foot long for materials less than one foot in width, finished as required for Project; Three full size samples of surface mounted letters and cartoon of each sign message including required wording and lettering layout.
2. Sign Sample: Standard unit representative of each type proposed for the Project demonstrating the colors, type face, finishes and assembly.

F. Quality Assurance Submittals: Acceptable documentation substantiating fabricator qualifications as determined by the Architect.

1.3 QUALITY ASSURANCE

A. Fabricator with five years successful experience in the design and fabrication of signage types required using materials and fabrication techniques as specified herein.
1. Provide listing of five Projects complete within the past three years indicate signage materials and types, Project location, Owner and designer contact names and telephone numbers.

B. Field Sample: Provide for each sign type as required for final work; acceptable field samples may be incorporated into the final work.

1.4 MAINTENANCE

A. Provide maintenance manual to Owner, include cleaning recommendations and information for ordering of replacement sign components and new signage.
   1. Include manufacturer's software program compatible with Owner's hardware to enable Owner to produce insert graphics for signage; include 4 hours operational instruction on software.
   2. Blank Paper Inserts: 100 sheets of each format and configuration required.

PART 2 - PRODUCTS

2.1 MANUFACTURED COMPONENTS

A. The Architect's design is based on products by APCO; similar systems by other manufacturers will be acceptable where deviations do not detract from the Architect's design as determined by the Architect. Subject to compliance with requirements, provide products by other manufacturers may be acceptable as provided for substitutions in the Work.
   1. Signage shall comply with barrier free access parameters of ANSI A117.1.

B. Signs: configurations, sizes, and finishes required. Fabricate with straight, true edges and smooth surfaces. Provide header format for message insert signs.
   1. Holder: Square corners, wall mounting for adhesive attachment. Finish, APCO A44 Architectural Brown or approved.
   2. Insert: Header type, tamper-resistant, removable mounting to holder using concealed snap-lock type anchors, APCO A44 Architectural Brown.
      a. Format: Justified left, APCO HF1 for text, HF20 for numbers.
      b. Paper: 20-pound acid free white bond.
   3. Stairwell Code Sign: 1/16-inch clear, non-glare acrylic panel with subsurface graphics; APCO 201A.

C. Sign Copy: True shapes, edges and corners, precisely formed lines and profiles, free of fabrication marks and imperfections. Accurately reproduce required typeface, size and spacing. Chemically bonded individual characters and abrasion blasted plastic laminate are not acceptable.
   1. Applied Copy: Silk screened, 1/32 inch raised characters in type size and face required and applied free of imperfections detrimental to sign legibility and service life.
      a. APCO PAB and PAL as scheduled.
   2. Vinyl Film: Opaque non-reflective, 0.0035 inch thick, with pressure sensitive adhesive backing, suitable for exterior and interior use.
   3. Tactile Copy: Grade 2 braille, to be chemically bonded to clear lens.

D. Directory: Single column format, custom size indicated, with manufacturer's standard message strip inserts and tamper resistant acrylic cover.
   1. Holder: Aluminum, APCO IS with square corners; Architectural Brown
   2. Message insert Strips: Manufacturer's standard molded plastic inserts; APCO I-50 and I-100 Directory Strips, A72 Bone White.

E. Finish: For applied, surface exposed text, provide final epoxy clear coat with acceptable non-glare finish; permanently encapsulate applied text.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install sign units level, and plumb at height and location required, with sign surfaces free from distortion or other defects in appearance. Mount with concealed fasteners and adhesive unless otherwise indicated, and as recommended by manufacturer for substrate; provide temporary support as necessary.
   1. Silicone Adhesive: Recommended by the sign manufacturer to attach sign units to irregular, porous, and vinyl-covered surfaces.

B. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions and protect units from damage until final acceptance.

END OF SECTION

SECTION 10 14 19 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes fabricated channel dimensional characters mounted to cast-in-place landscape wall.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Plan, Section and Elevation views, to scale, including dimensions, materials and finishes; mounting details, including concrete wall (to be provided by others).
   1. Show locations of electrical service connections.
   2. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

D. Delegated Design Submittal: For [**signs indicated in "Performance Requirements" Article**] <**Insert sign designations**>.
   1. Include structural analysis calculations for signs indicated to comply with design loads; signed and sealed by a professional engineer licensed in the State of California, and responsible for their preparation.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data.

1.4 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: [**Five**] <**Insert number**> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DIMENSIONAL CHARACTERS

A. Fabricated Channel Characters:: Basis of Design is Cast Aluminum Series as manufacturerd by Gemini Signage, a brand of Gemini, Inc., , with uniform faces, sharp corners, and precisely cast lines and profiles; internally braced for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners; and as follows.
   1. Finish: Anodized: Manufacturer's standard, in Champagne.[
   2. Mounting: Flush Stud.
   3. Font Style: Ribbon Deep.

4. Size: 12-inch height.

2.2 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. For exterior exposure, furnish stainless steel devices unless otherwise indicated.
3. Exposed Metal-Fastener Components, General:
   a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
4. Sign Mounting Fasteners:
   a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.
   b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

B. Adhesives and Sealants: As recommended by sign manufacturer.
1. Where exposed to view in completed installation, sealants and adhesives shall be submitted in proposed color for Architect approval in advance of installation.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.3 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
2. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
4. Internally brace dimensional characters for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
5. Drill and tap rabbets, lugs and tabs necessary to assembly components for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

PART 3 - EXECUTION

3.1 INSTALLATION OF DIMENSIONAL CHARACTERS

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
   a. Cast-in-Place Concrete Substrate: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
   a. Cast-in-Place Concrete Substrate: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.
3. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.

C. Remove temporary protective coverings and strippable films as signs are installed.

END OF SECTION 10 14 19

SECTION 10 23 10 – GLAZED INTERIOR WALL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for interior fenestration and entrances.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For glazed interior wall systems. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within five years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Components shall have the sections, profiles and general appearance indicated. Design is based on specific type and model aluminum systems by the basis of design manufacturer. As determined by the Architect, systems of other manufacturers may be acceptable where deviations neither effect, nor detract from performance, while providing the required sightlines and appearance

B. Performance Requirements: Comply with CBC Title 24 criteria for interior partition loads and deflection, and as necessary to comply with Section 08 81 00 limitations on glass deflection and breakage.

2.2 MANUFACTURERS

A. Frameless Glazed Interior Wall and Door Assemblies:

1. C.R. Laurence Co., Inc; CRL Clear View Series Frameless Glass Wall Office; CRL490 Series Top Hung Sliding Door System, CRL Wedge-Lock Low Profile Door Rail System.

2.3 FRAMELESS GLAZED INTERIOR WALL AND DOOR ASSEMBLIES

A. Frameless Glazed Interior Wall Assembly: Factory fabricated assemblies consisting of full-width and height glass panels fastened with low profile sidelite aluminum rail fittings on top and bottom edge of glass wall.
   1. Configuration: As indicated on drawings.
   2. Full Length Top and Bottom Sidelite Rails: 2-5/16 inch (59 mm) high by 1-1/2 inch (38 mm) deep with end caps.
   3. Sidelite Fittings, Clad Finish: Satin anodized.
   4. Glass Thickness: 1/2 inch (12.7 mm), tempered.
   5. Designed to withstand normal operation without damage, racking, sagging, or deflection.
   6. Coordinate wall and door assembly preparation and provide hardware as necessary for fully operable installation.
   7. Finished metal surfaces protected with strippable film.
   8. Factory assembled to greatest extent practical; may be disassembled to accommodate shipping constraints.

B. Sliding Glass Doors: Top supported without holes required in glass.
   1. Door Configuration: As indicated on drawings.
   2. Door Weight: 330 lb (150 kg), maximum.
   3. Track Size: 2-7/16 inch (62 mm) high by 2-7/16 inch (62 mm) deep with end caps.
      a. Overhead track size for single slider.
   4. Track Finish: Satin anodized and Brushed Stainless Anodized
   5. Glass Thickness: 1/2 inch (12.7 mm), tempered.
   6. Door Hardware: Center locks, brushed stainless steel.
   7. Provide accessories as required for complete installation.

C. Pivoting Glass Doors: Full length dry glazed rail fittings.
   1. Door Configuration: As indicated on drawings.
   2. Full Length Top and Bottom Rails: 2-5/16 inch (59 mm) high by 1-1/2 inch (38 mm) deep with end caps.
   3. Glass Thickness: 1/2 inch (12.7 mm), tempered.
   4. Sidelite Rails: Match door rail sightlines and finish.
   5. Aluminum Finish: Satin anodized.
   6. Door Hardware: Locking ladder pulls, brushed stainless steel.
   7. Provide accessories as required for complete installation.

2.4 FITTINGS AND HARDWARE

A. Operable Panel Hardware: Coordinate with additional requirements as specified in Section 08 71 00.

2.5 MATERIALS

A. Glass: Flat glass meeting requirements of ASTM C1036, Type I - Transparent Flat Glass, Class 2 - Tinted, Quality Q3, fully tempered in accordance with ASTM C1048, Kind FT, and as follows:

1. Thickness: As indicated.
2. Color: Grey tint; low iron.
3. Prepare glazing panels for indicated fittings and hardware before tempering.
4. Polish edges that will be exposed in finished work to bright flat polish.
5. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.

B. Aluminum Components: Conforming to ASTM B221 (ASTM B221M), Alloy 6063, T5 Temper.

C. Sealant: One-part silicone sealant, conforming to ASTM C920, clear.

2.6 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

B. Storefront Finish: Class I Clear Anodized Finish AA-M12C22A41.

C. Storefront Finish: 70% PVDF fluoropolymer coating in [color as selected by Architect from manufacturer’s standard colors] [custom color to match Architect’s sample].

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints unless otherwise indicated.

B. Metal Protection:
1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Provide permanent isolation of dissimilar metals and incompatible contact surfaces.

C. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

D. Install glazing as specified in Section 08 81 00 "Glass and Glazing."

E. Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

END OF SECTION

SECTION 10 26 00 – WALL AND CORNER PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Provide stainless corner guards and as indicated and as required for the Work.

1.2 SUBMITTALS

A. Shop Drawings: Provide each profile and assembly type required complete with, mounting components and attachments.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequencing and Scheduling: Provide retainer assemblies for installation sequence recommended by manufacturer, and to avoid delay in Progress of the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURED COMPONENTS

A. Corner Guard CG-1: Flush Mount, mechanically attached, Type 430 stainless steel, 16 gage, 4 satin finish, 3 or 3.50-inch equal length legs, profile for flush mounting in 0.625-inch GWB and as otherwise necessary for wall assembly types required.
   1. Acrovyn CO-8 and as necessary for details of wall framing, Pawling, InPro Corporation or approved products of other manufacturers as provided for substitutions in the Work.

B. Wall Protection WP-1: PVC and BPA-free engineered PETG, Acrovyn 4000 060N High-Impact Vinyl-Acrylic Sheets 0.040 inch thick.
   1. Color: As Scheduled.
   2. Sizes: As indicated in Drawings.

2.2 ACCESSORIES

A. Wall Protection:
   1. Provide extruded aluminum trim components in the profile and configuration indicated as required for finishing of perimeter edges.
   2. Accessories: Extruded components for joining of panels, inside and outside corners, trimming of penetrations and openings and similar installation details. Provide color and texture to match wall covering.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install impact-resistant wall protection in locations indicated level, plumb, and true to line without distortions. Do not use materials with surface defects or characteristics that effect appearance or diminish performance and service life.
   1. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.
   2. Provide concealed attachment to supporting construction using adhesives, concealed mechanical anchors and other devices as necessary to withstand impact loads and conditions of service as required.
      a. Locate component joints and splices where indicated, if not indicated provide in approved locations and utilize details standard with the manufacturer unless otherwise required.

B. Verify that corner wall assembly has been reinforced with double studs, complies with corner guard manufacturer's recommendations and UL assembly requirements for fire rated assemblies for durable corner guard installation. Notify Contractor in writing of incorrectly framed assemblies.

C. Install corner guard in sequence recommended by manufacturer; Provide toggle or expansion bolts, at least 0.25 inch in diameter, or other appropriate size and type of fastenings as recommended by manufacturer and required for UL listed assemblies for each specific type of installation and adjoining construction.

D. Install corner guards plumb and flush to wall surface as indicated, and as recommended by manufacturer; anchor with concealed fasteners at not more than 16 inches center to center interval, unless otherwise acceptable.
   1. Fire Rated: Install as required for UL listing and to maintain required fire resistance.
   2. Provide continuous metal backing at changes in wall finish materials as indicated.

END OF SECTION

SECTION 10 28 13 – TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes accessory products for toilet rooms and wash areas.

1.2 SUBMITTALS

A. Product Operation and Maintenance Data: Required for each toilet accessory.

B. Samples: Finish for each type required; furnish actual units for review of design and operation when directed, approved samples may be incorporated into the Work.

C. Shop Drawings: Field verified mounting Heights.

1.3 REGULATORY REQUIREMENTS

A. Design and install accessories to comply with barrier free access requirements of the Americans with Disabilities Act Accessibility Guidelines and ANSI A117.1 requirements for barrier free facilities.

B. Grab Bars and Supporting Construction: Capable of carrying loads as required by CBC Code Section 1607.7.2.

1.4 WARRANTY

A. Manufacturer's written 5-year warranty against silver spoilage of mirrors, agreeing to replace any mirrors which develop visible defects within warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide toilet accessories by Altadena Public Library System Standard (Bobrick Washroom Equipment, Inc.) products, unless noted otherwise.
   1. Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable.

2.2 MATERIALS

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage (.034") minimum, unless otherwise indicated.

B. Brass: ASTM B 19 flat products; ASTM B 16 rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gage (0.40") minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 527, G60.

E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.

F. Mirror Glass: 0.25-inch-thick laminated glass, electrolytically copper plated and protective organic coating.

G. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

2.3 MATERIALS

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage (.034") minimum, unless otherwise indicated.

B. Brass: ASTM B 19 flat products; ASTM B 16 rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359-inch minimum nominal thickness.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

E. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

F. Large Format Mirror: Silver coated mirror; product of GANA Mirror Division manufacturer member complying with ASTM C 1503 with copper-free backing, Guardian UltraMirror.

G. Galvanized Steel Mounting Devices: ASTM A 153, hot dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

2.4 COMPONENTS

A. Grab Bars: 18 gage stainless steel tube, 1.25-inch O.D. for concealed mounting, unless otherwise indicated, provide 1.5-inch clearance between wall surface and inside face of bar. Satin smooth finish, except non-slip in wet areas.
   a. Provide Bobrick Grab Bars B-5806, in satin, non-slip finish with snap flange and in lengths required.

B. Infant Changing Table: Comply with barrier free access requirements in both the closed and open in-use configurations. Require 5 pounds of force or less to open and use and otherwise comply with barrier free access requirements for use and operation including braille instructions for use. Provide vertical (short edge parallel to supporting wall) configuration unless otherwise indicated. Closed station shall be free of manufacturer markings.
   1. Basis of Design product is surface-mounted, stainless steel infant changing station KB300-SS by Koala Corporation, Koala Bear Kare.

C. Electric Hand Dryer: Basis of Design is Dyson [low voltage] [high voltage] Touch-Free Airblade V, HU02 Sprayed Nickel, anti-microbial finish.

2.5 FABRICATION

A. Trademark: Concealed or otherwise unobtrusive stamped logo. Provide printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number in concealed location.

B. Unless otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled.
   1. Hang doors or access panels with continuous stainless steel piano hinge.

C. Locked Dispensing Units: Key alike for all accessories.

D. Mirrors: Frame with 20 gage stainless steel channel with no.4 bright polish finish, miter corners. Provide plastic edge protection for glass.
   1. Backing and Support: 22 gage galvanized steel, full mirror size; rigid, tamperproof installation, prevent accumulation of moisture.
      a. Filler: Non-absorptive, corrugated cardboard not acceptable.
   2. Hangers: galvanized steel with concealed tamperproof locking devices, exposed fasteners are not acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify openings for recessed units, location of blocking, frames, and supports; spacing of plumbing fixtures and toilet partitions that affect installation of accessories.
   1. Verify wall reinforcing has been coordinated for grab bars in the configurations required and capable of supporting concentrated load of 250 pounds and as necessary for compliance with regulatory requirements.

B. Coordinate mounting locations and heights with other work to avoid interference and to assure proper operation and servicing of accessory units. Refer problems to Architect.

3.2 INSTALLATION

A. Install units plumb and level, firmly anchored in locations and at heights indicated. Drill holes to correct size and application that is concealed by item.
   1. Recessed: Placed into openings and anchored into blocking or frames.
   2. Grab-Bars: Resist required loads and comply with manufacturer's recommendations.

B. Mirrors: Tamperproof with special hanger, and anchors.

C. Adjust toilet accessories for proper operation and verify that mechanisms and locks function smoothly. Replace damaged and defective items.

D. Clean and polish all exposed surfaces after removing temporary labels and protective coatings.

3.3 ACCESSORIES SCHEDULE

A. Toilet and Bath Accessories Schedule: Provide Monterey Peninsula College Campus Standard (Bobrick Washroom Equipment, Inc. products, unless noted otherwise, as indicated:
1. Feminine Napkin/Tampon Dispenser : B-3706 wiith Free Operation Kit.
2. Recessed Sanitary Napkin Receptacle: B-353.
3. Surface-Mounted Sanitary Napkin Receptacle : B254.
4. Recessed Waste Receptacle: B-3644.
5. Surface Mounted Waste Receptacle: B-279.
6. OFCI: SC Johnson Touch-Free Ultra Dispenser, White, Legacy # TF2WHI.
7. Recessed Toilet Seat Cover Dispenser: B-301.
8. Mirror: B167 2448 and B-167-2436, as indicated in Drawings.
9. Grab Bar: B-5806 Series.
10. Heavy Duty Clothes Hook with Concealed Mounting: B-2116.
11. OFCI: Tork High-Capacity Bath Tissue Roll Dispenser for Opticare.
12. OFCI: Tork Mechanical Towel Roll Dispenser.

END OF SECTION

SECTION 10 41 16 - EMERGENCY KEY CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes requirements for key cabinet to provide building access to emergency service providers.

1.2 SUBMITTALS

A. Product Data: Submit for cabinet type required.

B. Shop Drawings: Dimensions and details showing mounting methods, relationships of box and trim to surrounding construction, cabinet type, materials and construction.
   1. Wiring Diagram: For integration of PIN access feature with building monitoring and security systems.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following: Knox Company, Supra, Fail-Safe or approved.

2.2 MANUFACTURED UNITS

A. Emergency Key Cabinets: Specifically design to house keys and other items essential for building access by emergency service personnel. UL labeled for resistance for forced access to contents and equipped with an alarm tamper switch integrated into the Owner's building access and security systems. Hinged, high-security door and storage cabinet for recessed mounting as indicated.
   1. Basis of Design is Knox-Box 3200 Series hinged door with RMK.
      a. Door Gasket: Provide weather-tight seal and prevent air infiltration and water penetration of box.
      b. Door Hardware: Stainless steel for components having weather exposure; continuous high-security hinge.
      c. Lock: UL Listed high-security, double-action rotating tumbler and hardened steel pins with secured key access.
      d. Monitoring and Access Alarm: UL Listed system and labeled components compatible with Owner's campus system.

B. Fabrication: Weld all joints and grind smooth, miter and weld perimeter frames and doors.

C. Cabinet Finish: Manufacturer's standard shop applied baked enamel finish system. Finish concealed and exposed surfaces of cabinet components. Protect finished components from damage during shipping and handling
   1. Color: Select from standard range of options.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cabinet in the location indicated, coordinated with wall assembly type and construction; recessed in wall and secured to wall construction plumb and true in location and height required.
   1. Provide integration of monitoring and alarm components with the Owner's building systems.

END OF SECTION

SECTION 10 44 00 – FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Fire extinguishers, extinguisher cabinets AED cabinets, and mounting brackets.

1.2 SUBMITTALS

A. Product Data: Submit for each extinguisher and cabinet type required.
   1. Shop Drawings: Dimensions and details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, and panel style and materials.
   2. Verify fire extinguisher cabinets are sized to accommodate fire extinguishers of type and capacity indicated and cabinet style required can be accommodated within the wall type indicated.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPITON

A. Design Requirements: UL listed and labeled extinguishers for type, rating, and classification of extinguisher indicated. Provide Factory Mutual approved extinguishers where necessary for Owner's insurance purposes.
   1. Extinguisher Size, Number and Location: Conform to recommendations in NFPA 10.
   2. Extinguisher Types and Capacity: Conform to UL classification and rating system.

2.2 MANUFACTURED UNITS

A. Manufacturers: Subject to compliance with requirements, provide basis of design Larsen’s Manufacturing Company Gemini Series, Model FS G-2409-R3 or equal, as approved by Architect from the following manufacturers:
   1. Sentry.
   2. Ansul.
   3. Kidde.
   4. Potter-Roemer.

B. Cabinets: Steel box, trim, door and frame as required; sized for extinguisher types and capacities required. Weld all joints and grind smooth, miter and weld perimeter frames and doors.
   1. Cabinet Type: Semi-recessed; provide UL listed and labeled fire-rated cabinets where required. Factory applied finish, white or to match wall color as directed.
   2. Trim: One piece with mitered corners, same metal as door.
   3. Door Style: [Full glass tubular stile and rail] [Vertical duo-panel] [Solid panel]. [Frameless full-glass panel] [Stile and rail with break glass panel with inside latch and lock].

a. Door Glazing: Clear tempered 1/8-inch float glass.
b. Door Hardware: Surface mounted door pull requiring no hand articulation to operate, and continuous piano hinge permitting 180 degree opening. Provide forcible break-free lock, Lasen-Loc or approved.

C. AED Cabinet: Fully recessed, basis of design is J.L. Industries Lifestart model 1415F12, provide trim profile to match appearance of FEC-2.

D. Subject to compliance with requirements, provide products of one of the following: J.L. Industries, Larsen's Mfg. Co, Muckle Manufacturing or Watrous, Inc.
1. Multi-Purpose Dry Chemical Type: UL-rated 4-A:60-B:C, 10 lb. nominal capacity, in enameled steel container.

E. Provide manufacturer's standard brackets designed to prevent accidental dislodgement of extinguisher, of sizes required for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

F. Finish:
1. Cabinet: Manufacturer's standard shop applied baked enamel finish system in color required. Finish concealed and exposed surfaces of cabinet components.
a. Color: Factory applied finish, white or to match wall color as directed.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide fire extinguishers for each extinguisher cabinet and other locations indicated. Provide brackets for extinguishers not located in cabinets and for those located in cabinets, where indicated or required.
1. In addition to locations shown on the Drawings provide bracket mounted fire extinguisher in each elevator machine room complying with ASME A17.1b 8.6.1.6.5.

B. Install items secured to structure, square and plumb at locations and heights indicated, where not indicated, in locations directed and at heights to comply with applicable regulations of governing authorities.
1. Provide UL listed and labeled fire-rated cabinets for installations in fire rated wall assemblies. Cabinet rating shall not be less than that required for the wall assembly and the installation of the cabinet shall not compromise wall assembly rating required.

END OF SECTION

SECTION 11 31 00 – RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for residential kitchen appliances and incidental utility service and connections for normal operation of equipment as intended.

1.2 SUBMITTALS

A. Product Data: Provide for each item of Equipment required include roughing-in dimensions, service characteristics and connection requirements and furnished accessories.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Provide residential appliances complying with the following.
   1. Products Listed and Labeled by a testing agency acceptable to authorities having jurisdiction and marked for intended use as defined in NFPA 70, Article 100, and UL.
   2. Comply with applicable standards of NEMA and NAECA.

PART 2 - PRODUCTS

2.1 MANUFACTURED COMPONENTS

A. The following appliance products of General Electric are the Basis of Design for the item of equipment specified. Provide accessories and optional components as necessary for installation type indicated for each appliance.
   1. Refrigerator: Model GNE27JMFS, 27 cubic feet, 36-inch width, Energy Star certified French Door Refrigerator with fingerprint resistant stainless steel finish.
   2. Built-in Microwave Oven: Model PEB7227ANDD, 2.2 cubic foot, 1650 Watt; ADA-compliant microwave in gray finish.
   3. Dishwasher: Model GDT226SSLS, 24-inch width Energy Star certified Top Control with Stainless Steel Interior and door liner; complies with barrier free access requirements, 47 dBA operating noise level with hard food disposer; with fingerprint resistant stainless steel finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions: Confirm proper coordination of field dimensions and drawings, rough-in requirements and utility service characteristics and connections. Correct unsatisfactory conditions.

3.2 INSTALLATION

A. Set each appliance securely in place, level and plumb, and to comply with barrier free access requirements. Anchor to supporting structure as necessary for sustained operation and use without shifting or dislocation. Conceal anchorages unless otherwise acceptable. Provide final connection to serving utilities.
   1. Where necessary to provide sanitary installation, seal joints between appliance and abutting assembly per Section 07 92 00 requirements.

B. Installed appliances shall comply with barrier free accessibility requirements of ANSI A117.1.
   1. Operable Parts: Forward reach to controls no higher than 48 inches above the floor, horizontal front reach no more than 25 inches, horizontal side reach no more than 24 inches. Hand articulation such as tight grasping, pinching, twisting of the wrist shall not be required for operation, and shall require less than 5 pounds of force to operate controls. Cooktop controls shall not require reaching across burners.

C. Test and demonstrate operation of Equipment to Owner prior to Substantial Completion.

END OF SECTION

SECTION 11 51 00 – LIBRARY EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for book return equipment.

1.2 SUBMITTALS

A. Product Operation and Maintenance Data for each item of equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Book Drop: Through-wall and Cabinet configurations:
   1. Interior Book Drop basis of design is Kingsley Library Equipment #K-TWHP Interior HallPass ThruWall:
      a. Construction: Stainless steel.
      b. Dimensions: 22 7/8” W x 8 13/16” D x 11” H.
      c. Drop Type: Single.
      d. Provide barrier free access compliant lettering and brail characters: BOOK RETURN.
   2. Exterior Depository basis of design is Kingsley Library Equipment 50 S-Series #00-9250:
      a. Construction: Fully sealed, 12-gauge aluminum cabinet and component construction fabricated without corner seams and incorporating theft deterrent chute, full length stainless steel hinged access door,; air-tight, fully sealed for weather tight and fire suppressive performance.
      b. Size: 30” W x 40 1/16” D x 53-5/8” H (cabinet); 18” W x 2 ½” H (depository).
      c. ADA Compliance: Provide with Braille tags, reading: BOOK DROP.
      d. Finish: As selected by Architect from manufacturer standard and custom options.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify openings for units, location of blocking, frames, and supports; coordination for secure anchorage and weatherproofing for exterior units.

B. Coordinate mounting locations and heights with other work to avoid interference and to assure access and operation of equipment complies with requirements of barrier free access regulations.

3.2 INSTALLATION

A. Install units plumb and level, firmly anchored in locations and at heights indicated. Drill holes to correct size and application that is concealed by item.
   1. Recessed: Placed into openings and anchored into blocking or frames.

END OF SECTION

11 52 13 – PROJECTION SCREENS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Automatic, electrically operated, roll-up projection screens, controls, and accessories.

1.2 RELATED SECTIONS

A. Section 05 50 00 - Metal Fabrications.

B. Section 26 00 10 – Electrical Work.

C. Section 09 22 16 - Non-structural metal framing

D. Section 09 53 15 - Acoustical Ceilings.

E. Section 08 31 13 - Access Doors and Panels

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Manufacturer's installation, operation, maintenance, and cleaning instructions.

C. Shop Drawings: Indicate dimensions, fabrication and installation details, and electric wiring diagrams. Indicate all dimension of screen in elevation.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with 10 years minimum successful experience manufacturing electric projection screens.

B. Installer Qualifications: Authorized and trained by the manufacturer to install systems required.

C. Definition of Terms for Specifications:
1. Fresnel lens: Lens composed of many small lenses arranged to produce a short focal length.
2. Gain: Indication of screen's luminance or brightness measured perpendicular of screen center and measured relative to a block of magnesium carbonate which serves

as the standard for 1.0 gain. Higher numbers indicate greater brightness. Gain shall be determined in accordance with SMPTE RP 94-2000.

3. Keystone: Distortion of projected image when screen is not perpendicular with center line of projected image.
4. Lenticulated: Surface onto which a pattern of small convex lenses have been impressed.
5. Viewing angle: Angle from perpendicular center of screen at which the gain or brightness is decreased by 50 percent

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. Draper, Inc.
2. Or equal

2.2 PROJECTION SCREENS

A. Basis of Design
1. Items specified are to establish a standard of quality for design, function, materials, and appearance.

B. Type A – Wall Mounted Electric Projection Screens – Draper Targa
1. Viewing Surface: Matt White XT1000E
2. Viewing format: See attached screen schedule.
3. UL Label: Recessed installed in return air ceiling plenums shall be certified by Underwriters Laboratory (UL), Inc. and shall bear UL label.
4. Size: See attached screen schedule.
5. Masking: Black masking borders.
6. Extra Drop Masking: See attached screen schedule
7. Finish: Coordinate finish with Architect.
8. Low voltage control: Single Motor Low Voltage Control (LCV) – built-in.
9. RS232 Serial Control
10. Wall switch: Low voltage, wall mounted, three position switch.
11. Limit switches: Pre-set, adjustable switches to automatically stop viewing surface, and case closure door where scheduled, in up or down positions.

12. Silent motor with LVC: Silent Motor with Integrated LVC for sizes up to 9 by 12 feet.
13. Ceiling trim/finish kit: Include manufacturer's recommended ceiling trim/finish kit accessory as required.
14. Mounting assemblies: Include manufacturer's recommended mounting brackets, hanging hardware, and all required attachment accessories required for a full and complete install.

2.3 VIEWING SURFACES CONSTRUCTION AND PERFORMANCE

A. Viewing Surfaces: Screen A
1. Matt White XT1000E: Flame retardant, mildew resistant, white, vinyl coated fiberglass screen that can be rolled and cleaned with mild soap and water solution.
2. Gain: 1.0.
3. Viewing angle: 60 degrees.
4. Masking: Black.
5. Drop: Refer to drawings for floor to ceiling height.
6. Drop Color: Black.
7. Seams: To the extent possible screen surfaces shall be seamless. Where required by size, provide a minimum number of flat, horizontal seams.
8. Vertical seams are not acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Coordinate provision of screens with locations of other wall and ceiling mounted components such as visual display boards, casework, structural framing, light fixtures, air diffusers, ducts, and fire sprinklers to eliminate potential conflicts.

B. Coordinate requirements for blocking, construction of recesses, and auxiliary structural supports to ensure adequate means for installation of screens.

C. Coordinate requirements for power supply, conduit, and wiring required for electric screen and controls.

D. For installation in non-accessible ceilings, coordinate a 24" x 24" access panel adjacent to low voltage connections at screen case.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Installation hardware: Provide attachment hardware, fasteners, and other components of type, size, and spacing recommended by manufacturer for complete, functional, secure installation of screens.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion

TABLE 1. AV PROJECTION SCREEN SCHEDULE

Room Number	Room Name	Screen Type	Viewable Image Size (Inches)	Distance from Bottom of Image to Finished Floor (Inches)	Total Black-drop (Inches)	Qty Per room
	Community Room	A	65 x 116	48	12	1

END OF SECTION

SECTION 12 24 13 – ROLLED CLOTH WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for horizontal, rolled-cloth shades having manual1 00 operation.

1.2 ADMINSTRATIVE REQUIREMENTS

A. Coordination Conference: Prior to finalizing submittals convene to coordinate details of shade installation, support, operation and control including but no limited to the following.
   1. Support and mounting requirements; integration with aluminum fenestration and other support assemblies.
      a. Verify compliance with clearance requirements for shade cloth from glazing plane.
   2. Shade size and configuration and banding for group operation or control.

1.3 SUBMITTALS

A. Product Data: Provide for manufactured components to be incorporated into the Work.
   1. Mechanical operators.
   2. Shade Cloth; include information on complete range of density, fabric types, pattern and colors available.
   3. Operation and Maintenance Manual: Complete detailed instructions for removal and replacement of shade cloth and operating components for system maintenance and repair. Recommendations for inspection protocol and frequency, and maintenance of shade cloth.

B. Shop Drawings: For entire assembly including connections to curtain wall and other assemblies complete with internal reinforcing and supplemental supports where required; provide elevations, sections and details of Project installation indicating field verified dimensions. Indicate type and location of component connections.
   1. Coordination Drawing and Templates: Provide for coordination of mountings on curtain wall components and other work.
   2. Structural Calculations: Sun control assemblies including loads imposed on support assemblies including but not limited to curtain wall frame. Demonstrate coordination with supporting work and provisions for reinforcing at support points.

C. Samples: Provide for final selection of shade cloth and finishes on all components exposed to view in the completed work.
   1. Provide complete range of finish type and colors available for shade components for final selection by Architect.
   2. Shade Cloth: Provide one square yard sample of each type of roller shade fabric in the density (percent open area), color and pattern required for the Work
   3. Shade Cloth Field Sample: Verify final selection; install full size shade cloth sample in opening as directed for final verification of fabric color, weave and density.

1.4 QUALITY ASSURANCE

A. Prior to fabrication, measure actual opening dimensions and indicate on required submittals; adjust shade dimensions for required fit at no additional cost to the Project.
   1. Field Measurements: Field verify actual dimensions necessary for each shade unit, and for sizing of motor and roller.

B. Rolled-Cloth Shades: Mechanical, electro-mechanical and components of hardware products of one manufacturer for each type of shade required.
   1. Shade Cloth: Product of the specified manufacturer or an approved substitute; the manufacturer of the shade components shall neither withhold their agreement nor revoke warranty coverage for an installation that requires fabric of another manufacturer.

1.5 WARRANTY

A. Provide manufacturer's five years warranty for mechanical and electro-mechanically operated shades, including without limitation control components and sensors.
   1. Shade Cloth: Ten years warrant term; shall deteriorate neither from exposure to visible light, UV nor heat, remain color fast with no fading and chalking with no crazing or cracking of fibers.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Shade assembly, accessory components and anchors shall be coordinated with curtain wall and other work for effective shading of glazed assemblies with shades in locations, sizes and configuration indicated.
   1. Configure mountings for attachment to aluminum fenestration components and assemblies as required and in coordination with work of Division 8 Section specifying fenestration products.
   2. Do not exceed the structural capacity of supporting members, provide reinforcing and supplementary supports as necessary for attachment points.
      a. Anchors and Attachment Points: provide a load safety-factor of four.
   3. Each shade unit shall be removable with disturbing neither adjacent shades nor the glazing assembly.

B. Performance Requirements:
   1. Shade Cloth: Comply with ASTM E 84; Flame Spread, 25; Smoke Developed, 50 and pass NFPA-701 criteria for small- or large-scale test as required by the Fire Marshall.

2.2 MANUALLY OPERATED SHADES

A. Manually Operated Roller Shade: Complete assembly including roller, drive mechanism, brackets, and shade enclosure.
   1. Shade Enclosure: Reverse roll configuration, fully conceal shade mountings, roller, and drive mechanism. Match fascia size provided for motorized units.

B. Operating Components: Permit removal of roller tube without removing hardware from opening. Allow for multi-banded operation of manually controlled shades. Shade shall operate via a geared driving mechanism; friction drive is not acceptable.
   1. Shade Hardware: Heavy duty commercial components. Metal parts shall be a minimum 0.125-inch-thick cadmium plated steel. Provide plastic components made of DuPont Delrin™, styrene polymers are not acceptable.
   2. Drive Chain: No. 10 stainless steel.

C. Shade Cloth: Suitable for interior applications, with integral treatment to prevent biological growth on shade cloth fibers. Fabricate to completely fill each opening from jamb-to-jamb and head-to-sill and provide a 2-inch overlap at jambs and sill of aperture.
   1. Mechoshade Ecoveil Sheet 6750 Series.
   2. Mounting: Spline mount to roller drum; removable without removing the roller or shade brackets nor affecting the shade motor.
   3. Bottom Bar: Manufacturer's standard continuous, weighted, anodized aluminum bar.
   4. Color: As Scheduled in Drawings.

D. Blackout Shade cloth: Four-ply woven fiberglass and PVC film fabric, passing NFPA 701 flame test, in 72-, 84- or 96-inch width as necessary for seamless applications in shade dimensions required.
   1. Mechoshade Chelsea Blackout 0250.
   2. Color: As Scheduled in Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Field verify opening sizes with required margins and indicate on shop drawings.

3.2 INSTALLATION

A. Install units to comply with manufacturer's instructions for type of mountings and operations required. Provide units plumb and true, securely anchored in place with recommended hardware and accessories.
   1. Installer shades per the Contractor’s design per the approved submittals and to comply with System Description requirements.

B. Tolerances: Deviation from vertical not more than 0.25 inch in 10 feet. Maximum offset from level 0.0625 inch in 5 feet. Alignment of adjacent shades, maximum offset of 0.125 inch over three shade units.

END OF SECTION

SECTION 12 48 16 – ENTRANCE FLOOR GRILLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface applied or recessed floor mats and frames.

1.2 DESIGN REQUIREMENTS

A. Comply with barrier free design requirements of ANSI A 117.1 for accessible floor surfaces transitions and similar requirements.

1.3 PERFORMANCE REQUIREMENTS

A. Slip Resistance of Traffic Surface: Provide Static coefficient of friction to qualify as slip-resistant walkway per voices of Safety International VOSI V41.21 test method and definition 3.1.6.

1.4 SUBMITTALS

A. Product Data: Submit for each mat type required.

B. Samples: 12 inches square of each finished mat material in colors and patterns required.

C. Shop Drawings: Full scale sections of typical installations. Show details of patterns or designs, anchors, and accessories. Indicated coordination with concrete work for recessed slabs and imbeds.

D. Maintenance Data: Manufacturer's instructions for servicing removable entrance mats.

1.5 QUALITY ASSURANCE

A. Field Measurements: Verify sizes of recessed mats prior to shop fabrication.

B. Sequence and Scheduling: Delay frame installations until building enclosure is completed, and completion of other interior finish work and flooring unless otherwise required.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum: 6063-T5 alloy extrusions.

B. Provide manufacturer's standard protective coating on metals that may be in contact with concrete or otherwise exposed to conditions that may cause corrosion.

2.2 FABRICATION

A. Provide mat sizes and configurations indicated modify standard units as necessary to conform to required size and configuration.

B. Shop fabricate mats to greatest extent possible. Unless otherwise indicated provide single unit for each mat installation, but do not exceed manufacturer's maximum size recommendation for units intended for removal and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements, with hairline joints, or provide prefabricated corner units without joints.
1. Frames: For recessed installation as indicated; complete with imbeds, supports, anchors and accessories. Provide members in maximum available lengths to minimize need for joints.
2. Frames that are not continuously supported by subfloor: Structure for spans indicated and necessary loads, provide supplemental members and supports as necessary.
3. Joints: Hairline tight, and equally spaced.

2.3 MANUFACTURERS

A. Mats and Frames: Provide specified product of Construction Specialties 503.287.7135. Subject to compliance with Project requirements products of the following may also be acceptable, submit Substitution Request prior to bidding; Arden Architectural Specialties Inc., 206.450.5052; Reese 800.345.6287.

2.4 MANUFACTURED COMPONENTS

A. Recessed Deep Pit Frame with slope to drain Walk-off Grid: Provide in sizes and configuration indicated at building entrance. 1-11/16 inch depth with extruded aluminum rails joined by continuous perforated PVC hinge with heavy duty carpet insert. Construction Specialties Pedigrid (G1).
1. Rail/Frame Finish: As selected by Architect from Manufacturer’s standards.
2. Insert: Colorfast, solution dyed, 100 percent nylon, fusion bonded to rigid two-ply backing with antimicrobial treatment; 33 ounces per square yard.
a. Color: As selected by Architect.

B. Recessed Walk-off Mat: Basis of design products are as manufacturered by Construction Specialties:
1. Main Floor Level Entrance: Pedimat Model M2, all aluminum construction with exterior carpet insert.
2. Lower Level Entrance: PediTred Model G4; aluminum rail and frame finish and insert as selected by Architect from manufacturer options.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify coordination of formwork for recessed pits and location of imbeds and similar anchoring devices.

B. Where drainage of recessed floor areas is indicated coordinate installation of drains and plumbing with work of this Section.

3.2 INSTALLATION

A. Entrance Mats and Frame: Comply with manufacturer's instructions, at locations indicated, where not indicated orient for traffic patterns and entrance location; level and properly aligned for most effective service without creating impediments to traffic, align mat and frame to one another and to adjoining finished flooring; coordinate top of mat surfaces with doors that swing across mats for proper clearance.

B. Fixed Frames: Anchor to floor using manufacturer's standard system recommended for installation type and mounting surfaces indicated.

C. Protection: Upon completion of frame installations and concrete work; provide temporary filler of plywood or fiberboard in mat recesses, and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and project is near time of substantial completion.

END OF SECTION

SECTION 12 52 19 – CUSTOM UPHOLSTERED SEATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for custom upholstery for fixed seating.

B. Related Sections:
1. Section 06 40 00 Architectural Woodwork.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Prefabrication Meeting: Review shop drawings for casework banquettes and coordinate upholstery cushion modules and configuration for required fit and attachment method.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's complete technical information demonstrating compliance with specified requirements, including maintenance instructions and precautions.
1. Document upholstery compliance with State of California, Department of Consumer Affairs, Bureau of Home Furnishings Technical Bulletin 133 and UFAC Class 1 (NFPA 260A).

B. Shop Drawings: Submit shop drawings indicating seat and back construction, seam location and construction and cushion attachment to seating.
1. Coordinate with work of Section 06 40 00 for built in seating to receive upholstered cushions as work of this Section.

C. Samples:
1. Upholstery Fabric: Provide two 12 by 24-inch (nominal) pieces joined with 24-inch-long Blind stich seam using thread and SPI as proposed for the Work.
2. Foam Cushion Selection Samples: Demonstrate a range of density, firmness, resilience and support in foam cushioning for both seat and back cushions for final selection.
3. Provide 24-inch section of full-size seat and back cushions in the configuration required and demonstrating construction methods and materials to be provided in the final work.

D. Certificates: Document that upholstery complies with specified smoke development and flame spread requirements of this Section and complies with performance criteria of State of California, Department of Consumer Affairs, Bureau of Home Furnishings Technical Bulletin 133.
1. Submit written certification of compliance of resilient filling materials with specified standards.

1.4 QUALIFICATIONS

A. Upholstery Fabricator: A minimum of 5 years successful experience with work commercial upholstery work similar in scope and complexity to that required for the Project and having adequate production facilities to conform to Project requirements.

1.5 MAINTENANCE

A. Maintenance Overstock: Furnish additional 5% of fabric for Owner maintenance. Deliver as directed.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Design Requirements: Fabricate upholstery to dimensions and configuration required for seat backs and seat cushions using materials and construction techniques complying with Upholstered Furniture Action Council, and mechanical, safety and performance standards of ANSI/BIFMA X5.4 and Project requirements.
   1. Seat Cushions: Provide Dacron wrapping, minimum 0.5-inch thickness and fabricated of high resiliency, high density foam.
   2. Back Cushions: Fabric casing with four horizontal sag-resistant chambers with blown in Dacron/polyester filling.
   3. Provide concealed zippered closure for all cushions allowing removal of covering and access to cushion interior.
   4. Provide approved concealed attachment of cushions to banquette seat and back that firmly holds cushions in place but allows for removal for cleaning, repair and access to ballasts concealed within the banquette.

B. Performance Requirements: Provide completed upholstery complying with the following.
   1. Comply with State of California, Department of Consumer Affairs, Bureau of Home Furnishings Technical Information Bulletin 117 flame smolder resistance of upholstered cushions and pass UFAC Class 1 (NFPA 260A).
   2. Fabric Abrasion Resistance: 45,000 cycles, Heavy Duty Commercial rating.

2.2 MATERIALS AND FABRICATION

A. Fabricate upholstery to dimension, configurations, and details indicated on drawings.

B. Foam Cushion: Combustion modified type urethane foam 2.5-pound density wrapped with Dacron "Fibercoil" slip sheet.
   1. Comply with State of California, Department of Consumer Affairs, Bureau of Home Furnishings "Technical Information Bulletin 117" February 1975, for flame retardance of cushion.

C. Upholstery: Class A (ASTM E 84), UFAC Class 1 (NFPA 260A)
   1. FA1: DesignTex Gamut.
      a. Color: Stone, #3468-806.
      b. Content: 100 % Polyester.
      c. Width: 54 in.
      d. Finish: Stain Repellent.

e. Durability: Exceeds 100,000 (Wyzenbeek) double rubs per ASTM D 4157.

2. FA-2: Design Tex Gamut.
   a. Color: Olive, #3468-503.
   b. Content: 100 % Polyester.
   c. Width: 54 in.
   d. Finish: Stain Repellent.
   e. Durability: Exceeds 100,000 (Wyzenbeek) double rubs per ASTM D 4157.
3. FA-3: Design Tex Gamut.
   a. Color: Finch, #3468-204.
   b. Content: 100 % Polyester.
   c. Width: 54 in.
   d. Finish: Stain Repellent.
   e. Durability: Exceeds 100,000 (Wyzenbeek) double rubs per ASTM D 4157.
4. FA-4: Design Tex Gamut.
   a. Color: Cadet, #3468-409.
   b. Content: 100 % Polyester.
   c. Width: 54 in.
   d. Finish: Stain Repellent.
   e. Durability: Exceeds 100,000 (Wyzenbeek) double rubs per ASTM D 4157.
5. FA-5: Design Tex Gamut.
   a. Color: Nutmeg, #3468-104.
   b. Content: 100 % Polyester.
   c. Width: 54 in.
   d. Finish: Stain Repellent.
   e. Durability: Exceeds 100,000 (Wyzenbeek) double rubs per ASTM D 4157.

D. Seat Cushion Construction: Provide attached, full boxed cushion with welted seams. Construct welts using 5/32-inch diameter cord; 4-inch thickness as indicated on drawings.

E. Back Cushion Construction: Provide attached, full boxed cushion appearance with welted seams. Construct welts using 5/32" dia. Cord; 2-inch thickness as indicated on drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Inspect seating for conditions for damage or deterioration and correct unacceptable conditions as required.
   1. Clean seating to receive upholstered cushions immediately prior to installation.
   2. Prepare installation substrate as necessary for cushion attachment using the approved means and materials.

B. Install upholstery to comply with System Description requirements and recommendations of the upholstery fabricator and fabric manufacturer. Ensure correct orientation of upholstery pattern and series cushion configuration and construction.
   1. Attach cushions to seating supports to comply with System Description requirements.

C. Provide temporary covers or other approved protection to prevent damage to cushions during completion of construction operations. Remove protection at final acceptance.

END OF SECTION

SECTION 12 93 00 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Work Included: Provide and install including but not limited to:

1. Trash and Recycling Receptacles
2. Benches
3. Pots
4. Picnic Tables.

1.2 QUALITY ASSURANCE

A. Product Data: Submit manufacturer's current literature for the following items:

1. Color, finish, texture and size for each type of furnishing.
2. Installation instructions and recommendations for general maintenance.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Labeling: Furnish all materials in manufacturer's unopened, original containers, bearing original labels showing quantity, description and name of manufacturer.

B. Delivery: Deliver and unload at the site on pallets and bound in such a manner that no damage occurs to the product.

C. Storage: Store products in a manner which will preclude all damages. Damaged materials will be rejected. Remove all damaged materials from the job site immediately, and replace at no cost to Owner.

D. Handling: Furnish suitable equipment to locate all site furnishing materials carefully and efficiently. Lift materials using lifting inserts provided by manufacturer where applicable.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Refer to plans for manufacturer, model, color, finish and quantity.

PART 3 - EXECUTION

3.1 GENERAL

A. Do not install site and street furnishings prior to acceptance by Owner of area to receive such materials. Install as directed by Owner and as shown on the drawings.

3.2 CLEAN-UP

A. Keep all areas of work clean, neat and orderly at all times.

B. Clean up and remove all debris from the entire work area to satisfaction of Owner prior to Final Acceptance

END OF SECTION 12 93 00

SECTION 14 21 00 ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Electric Traction Elevators.

B. Products Supplied but Not Installed Under this Section:
1. Hoist Beam
2. Lifeline attachment steel

C. Work Supplied Under Other Sections:
1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.
2. Main line disconnects for each elevator.
3. One fused three phase permanent power in building electrical distribution room
4. Hoistway ventilation shall be in accordance with local and national building code requirements.
5. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layouts.
6. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.
7. Lifeline attachments capable of withstanding 5000 lb load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.
8. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASME A17.1/CSA B44 2000, or applicable version.
9. Control space lighting with switch. Coordinate switch with lighting for machine space as allowable by code.

D. Related sections:
1. Section 01 50 00 – Temporary Facility and Controls
2. Section 03 30 00 - Cast-in-Place Concrete:
3. Section 04 20 00 - Unit Masonry
4. Section 05 50 00 - Metal Fabrications
5. Section 07 16 00 - Cementitious Waterproofing
6. Section 23 00 00 - Heating, Ventilating, and Air Conditioning
7. Section 26 00 00 - Electrical
8. Section 26 30 00 - Electric Power Generating and Storing Equipment
9. Section 27 30 00 - Voice Communications
10. Section 28 31 00 - Fire Detection and Alarm
11. Section 31 00 00 – Earthwork

E. Industry and government standards:
1. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
2. ADAAG - Accessibility Guidelines for Buildings and Facilities
3. ANSI/NFPA 70, National Electrical Code
4. ANSI/NFPA 80, Standard for Fire Doors and Fire Windows
5. ASME/ANSI A17.1, Safety Code for Elevators and Escalators.

1.2 DESCRIPTION OF ELEVATOR

A. Elevator Equipment: KONE Machine Room-Less gearless traction elevator

B. Equipment Control: KCM831

C. Drive: Non Regenerative

D. Quantity of Elevators: 1 Elevator

E. Landings: 3

F. Openings: 2 Front Openings (1st and 3rd levels), 1 Back Opening (2nd level)

G. Travel: 20’ 8”

H. Rated Capacity: 3,500 lb

I. Rated Speed: 150 FPM

J. Clear Inside Dimensions: (W x D) 6' 5 11/16" x 5' 6 11/16"

K. Cab Height: 8'

L. Clear height under suspended ceiling: 7'-6"

M. Entrance Width and Type: 42" and Right Opening

N. Entrance Height: 7'-0"

O. Main Power Supply: 480 V Volts + 5%, three-phase

P. Operation: Simplex

Q. Machine Location: Inside the hoistway mounted on car guide rail

R. Control Space Location: Remote room at 1st floor

S. Elevator Equipment shall conform to the requirements of seismic zone: Seismic
1. Maintenance Service Period: 12 Months

1.3 PERFORMANCE REQUIREMENTS

A. Car Performance
1. Car Speed ± 5% of contract speed under any loading condition or direction of travel.
2. Car Capacity: Safely lower, stop and hold (per code) up to 125% of rated load.

B. System Performance
1. Vertical Vibration (maximum): 15 mg ISO187338/ISO 8041 system pk – pk
2. Horizontal Vibration (maximum): 12 mg ISO187338/ISO 8041 system pk – pk
3. Jerk Rate (maximum): 3.3 ft/sec3

4. Acceleration (maximum): 1.3 ft/sec2
5. In Car Noise: 55 dB(A) Maximum
6. Leveling Accuracy: ±0.2 inches
7. Starts per hour (maximum): 240

1.4 SUBMITTALS

A. Comply with Section 01 33 00 - Submittal Procedures.

B. Product Data: Submit manufacturer's product literature for each proposed system.
1. Cab design, dimensions and layout.
2. Layout, finishes, and accessories and available options.
3. Controls, signals and operating system.
4. Color selection charts for cab and entrances.

C. Shop Drawings:
1. Clearances and travel of car.
2. Clear inside hoistway and pit dimensions.
3. Location and layout of equipment and signals.
4. Car, guide rails, buffers and other components in hoistway.
5. Maximum rail bracket spacing.
6. Maximum loads imposed on building structure.
7. Hoist beam requirements.
8. Location and sizes of access doors.
9. Location and details of hoistway door and frames.
10. Electrical characteristics and connection requirements.

D. Operation and maintenance data:
1. Provide manufacturer's standard maintenance and operation manual.

E. Diagnostic Tools
1. Prior to seeking final acceptance for the completed project as specified by the Contract Documents, the Elevator Contractor shall deliver to the Owner any specialized tool(s) that may be required to perform diagnostic evaluations, adjustments, and/or parametric software changes and/or test and inspections on any piece of control or monitoring equipment installed.
2. This shall include any specialized tool(s) required for monitoring, inspection and/or maintenance where the means of suspension other than conventional wire ropes are furnished and installed by the Elevator Contractor. Any and all such tool(s) shall become property of the Owner. Any diagnostic tool provided to the Owner by the Elevator Contractor shall be configured to perform all levels of diagnostics, systems adjustment and parametric software changes which are available to the Elevator Contractor.
3. In those cases where diagnostic tools provided to the Owner require periodic recalibration/ or re-initiation, the Elevator Contractor shall perform such tasks at no additional cost to the Owner
for a period equal to the term of the maintenance agreement from the date of final acceptance of the competed project During those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation, or repair, the Elevator Contractor shall provide a temporary replacement for the tool at no additional cost to the Owner.

4. The Elevator Contractor shall deliver to the Owner, printed instructions for the proper use of any tool that may be necessary to perform diagnostic evaluations, system adjustment, and/or parametric software changes on any unit of microprocessor-based elevator control equipment and means of suspension other than standard elevator steel cables furnished and install by the Elevator Contractor. Accompanying the printed instructions shall be any and all access codes, password, or other proprietary information that is necessary to interface with the microprocessor- control equipment.

1.5 QUALITY ASSURANCE

A. Manufacturer: Minimum of fifteen years' experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.

B. Installer: The equipment manufacturer shall install the elevator.

C. Inspection and Testing: In accordance with requirements of local jurisdiction, obtain required permits, inspections and tests.

1.6 DELIVERY, STORAGE AND HANDLING

A. If the construction site is not prepared to receive the elevator equipment at the agreed ship date, the General Contractor shall be responsible for the cost of storage at an approved facility. Additional labor costs for double handling will be the responsibility of the General Contractor.

B. Delivered elevator materials shall be stored in a protected environment in accordance with manufacturer recommendations. A minimum storage area of 10 feet by 20 feet is required adjacent the hoistway.

1.7 WARRANTY

A. Provide manufacturer warranty for a period of one year. The warranty period is to begin upon final acceptance of the Contract. Warranty covers defects in materials and workmanship. Damage due to ordinary use, vandalism, improper or insufficient maintenance, misuse, or neglect do not constitute defective material or workmanship.

1.8 MAINTENANCE SERVICE

A. The elevator manufacturer shall provide maintenance service consisting of regular examinations and adjustments of the elevator equipment for a period of 12 Months after date of final acceptance.
   1. Predictive maintenance shall be included for the full maintenance period. This service must be capable of using AI-based analytics to identify potential equipment issues and notifying the elevator provider via an internet connection.
   2. Replacement parts shall be produced by the original equipment manufacturer.

B. Maintenance service to be performed during regular working hours of regular working days and shall include emergency call back service during regular working hours.

C. Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Provide AC gearless machine room-less elevator systems subject to compliance with the design and performance requirements of this specification. Elevator manufacturers may include but are not limited to one of the following:
   1. Basis of Design: KONE Machine Room-Less traction elevators by KONE, Inc. (www.kone.com). Art Martinez 562.577.4975 art.martinez@kone.com

2.2 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microcomputer-based control system to perform all functions.
   1. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.
   2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
   3. Provide a serial cardrack and main CPU board containing a non- erasable EPROM and operating system firmware.
   4. Variable field parameters and adjustments shall be contained in a non- volatile memory module.
   5. Drive: Provide Variable Voltage Variable Frequency AC drive system to develop high starting torque with low starting current.

B. Controller Location: Locate controller{s} in remote room, machine side of the elevator. One non-fused three phase permanent power in hoist way at top landing. A separate control space should not be required.

2.3 EQUIPMENT: HOISTWAY COMPONENTS

A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current

B. electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway

C. Governor: Friction type over-speed governor rated for the duty of the elevator specified.

D. Buffers, Car and Counterweight: Polyurethane buffer.

E. Hoistway Operating Devices:
   1. Emergency stop switch in the pit
   2. Terminal stopping switches.
   3. Emergency stop switch on the machine

F. Positioning System: System consisting of magnets and proximity switches.

G. Guide Rails and Attachments: Steel rails with brackets and fasteners.

2.4 EQUIPMENT: HOISTWAY ENTRANCES

A. Hoistway Entrances
1. Sills: Extruded Aluminum.
2. Doors: Hollow metal construction with vertical internal channel reinforcements.
3. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hour.
4. Entrance Finish: Brushed Stainless Steel.
5. Entrance Markings Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.5 EQUIPMENT: CAR COMPONENTS

A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.

B. Car Safeties: Device will be provided and mounted under the car platform, securely bolted to the Car Frame. The safety will be actuated by a centrifugal governor mounted at the top of the hoistway. The Safety is designed to operate in case the car attains excessive descending speed.

C. Platform: Platform shall be all steel construction.

D. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

E. Car Wall Finish:
1. Side Walls: 441 Brushed Stainless Steel (4SS)
2. Rear Wall: 441 Brushed Stainless Steel (4SS)
3. Car front, Door and Skirting: Brushed Stainless Steel
4. Ceiling: Round, LED spotlights
5. Handrails: Brushed Stainless Steel
   a. Rails to be located on Side Walls of car enclosure.
6. Sills: Aluminum extruded.

F. Cab Wall Protection Pads to be included.

G. Flooring: By others. (Not to exceed 6lb/sq ft and 1/2" finished depth.)

H. Emergency Car Signals
1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
2. Emergency Car Lighting: Provide emergency power unit employing a 12- volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

I. Ventilation: Manufacturer's standard cab fan

2.6 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Fixture finish to be Brushed Stainless Steel
   1. Main Flush mounted car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons have Amber Dot Matrix illumination (halo). All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be Amber Dot Matrix. All texts, when illuminated, shall be Amber Dot Matrix. The car operating panel shall have a Brushed Stainless Steel finish.
   2. Additional features of car operating panel shall include:
      a. Car Position Indicator within operating panel Brushed Stainless Steel
      b. Elevator Data Plate marked with elevator capacity and car number on car top.
      c. Help buttons with raised markings.
      d. In car stop switch per local code.
      e. Call Cancel Button.

B. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a Brushed Stainless Steel finish.
   1. Hall fixtures shall feature round, mechanical, buttons in applied mount face frame. Hall fixtures shall correspond to options available from that landing. Buttons shall be in a vertically mounted fixture.

C. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel, and a chime will sound. The chime will sound once for up and twice for down. The car riding lantern face plate shall have a Brushed Stainless Steel finish.

2.7 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation
   1. Simplex Collective Operation: Using a microprocessor- based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
   2. Zoned Car Parking.
   3. Relative System Response Dispatching.

B. Standard Operating Features to include:
   1. Full Collective Operation
   2. Fan and Light Control.
   3. Load Weighing Bypass.
   4. Ascending Car Uncontrolled Movement Protection
   5. Top of Car Inspection Station.

C. Additional Operating Features to include:
   1. Independent Service.
   2. Hoistway Access Bottom Landing.
   3. Hoistway Access Top Landing.
   4. Car Wall Protection Pads
   5. Provision for Card Reader in Car (Card Reader provided and Installed by others).

6. Provide provisions for coaxial cable for CCTV. CCTV by others.
7. Standby Power

D. Elevator Control System for Inspections and Emergency
1. Provide devices within controller to run the elevator in inspection operation.
2. Provide devices on car top to run the elevator in inspection operation.
3. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.
4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.
5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
7. Provide the means for the control to reset elevator earthquake operation.

2.8 EQUIPMENT: DOOR OPERATOR AND CONTROL

A. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.

B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.

D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.

E. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Field measure and examine substrates, supports, and other conditions under which elevator work is to be performed.

B. Do not proceed with work until unsatisfactory conditions are corrected.

C. Prior to start of work, verify hoistway is in accordance with shop drawings. Dimensional tolerance of hoistway from shop drawings: -0 inches +2 inches. Do not begin work of this section until dimensions are within tolerances.

D. Prior to start of work, verify projections greater than two inches (four inches if ASME A17.1/CSA

E. B44 2000 applies) must be beveled not less than 75 degrees from horizontal.

F. Prior to start of work, verify landings have been prepared for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.

G. Prior to start of work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approved submittal. Verify that sumps or sump pumps located within pit will not interfere with installed elevator equipment.

H. Prior to start of work, verify control space has been constructed in accordance with requirements, with access coordinated with elevator shop drawings, including sleeves and penetrations.

I. Verify installation of GFCI protected 20-amp in pit and adjacent to each signal control cabinet in control space.

3.2 PREPARATION

A. Coordinate installation of anchors, bearing plates, brackets and other related accessories.

3.3 INSTALLATION

A. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.

B. Properly locate guide rails and related supports at locations in accordance with manufacturer' s recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.

C. All hoistway frames shall be securely fastened to fixing angles mounted in the hoistway. Coordinate installation of sills and frames with other trades.

D. Lubricate operating system components in accordance with manufacturer recommendations.

E. Perform final adjustments, and necessary service prior to final acceptance.

3.4 CONSTRUCTION

A. Interface with Other Work:
1. Guide rail brackets attached to steel shall be installed prior to application of fireproofing.
2. Coordinate construction of entrance walls with installation of door frames and sills. Maintain front wall opening until elevator equipment has been installed.
3. Ensure adequate support for entrance attachment points at all landings.
4. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.
5. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.
6. Coordinate interface of elevators and fire alarm system.
7. Coordinate interface of dedicated telephone line.

3.5 TESTING AND INSPECTIONS

A. Perform recommended and required testing in accordance with authority having jurisdiction

B. Obtain required permits and provide originals to Owner’s Representative.

3.6 DEMONSTRATION

A. Prior to final acceptance, instruct Owner’s Representative on the proper function and required daily maintenance of elevators. Instruct personnel on emergency procedures.

END OF SECTION

SECTION 21 13 13 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pipes, fittings, and specialties.
2. Fire-protection valves.
3. Fire-department connections.
4. Sprinklers.
5. Alarm devices.
6. Pressure gages.

B. Related Sections:
1. Division 21 Section "Fire-Suppression Standpipes" for standpipe piping.

1.2 SYSTEM DESCRIPTIONS

A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.3 PERFORMANCE REQUIREMENTS

A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.

B. Delegated Design: Design sprinkler system(s), including comprehensive engineering analysis by a qualified professional fire protection engineer, using performance requirements and design criteria indicated.
1. Available fire-hydrant flow test records indicate the following conditions:
a. Date: .
b. Time:
c. Performed by: of.
d. Location of Residual Fire Hydrant R: .
e. Location of Flow Fire Hydrant F: .
f. Static Pressure at Residual Fire Hydrant R: .
g. Measured Flow at Flow Fire Hydrant F: .
h. Residual Pressure at Residual Fire Hydrant R: .

C. Sprinkler system design shall be approved by authorities having jurisdiction.
1. Margin of Safety for Available Water Flow and Pressure: 20 percent, including losses through water-service piping, valves, and backflow preventers.
2. Sprinkler Occupancy Hazard Classifications:
a. Building Service Areas: Ordinary Hazard, Group 1.
b. Electrical Equipment Rooms: Ordinary Hazard, Group 1.
c. General Storage Areas: Ordinary Hazard, Group 1.
d. Mechanical Equipment Rooms: Ordinary Hazard, Group 1.

e. Office and Public Areas: Light Hazard.
f. Theater/Stage: Ordinary Hazard Group 2.

3. Minimum Density for Automatic-Sprinkler Piping Design:
   a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
   b. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
   c. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. area.
4. Maximum Protection Area per Sprinkler:
   a. Office Spaces: 120 sq. ft..
   b. Storage Areas: 130 sq. ft..
   c. Mechanical Equipment Rooms: 130 sq. ft..
   d. Electrical Equipment Rooms: 130 sq. ft..
   e. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.
5. Total Combined Hose-Stream Demand Requirement: According to NFPA 13 unless otherwise indicated:
   a. Light-Hazard Occupancies: 100 gpm for 30 minutes.
   b. Ordinary-Hazard Occupancies: 250 gpm for 60 to 90 minutes.

D. Seismic Performance: Sprinkler piping shall withstand the effects of earthquake motions determined according to NFPA 13.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For wet-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.
1. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Qualification Data: For qualified Installer and professional fire protection engineer.

E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

F. Welding certificates.

G. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

H. Field quality-control reports.

I. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
   a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.

B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
   1. NFPA 13, "Installation of Sprinkler Systems."
   2. NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances."

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. Schedule40 piping is required for all branch lines and arm-overs.

C. Schedule 40 piping is required for mains, regardless of pipe diameter.

D. Galvanized pipe shall be used when exposed to the outside.

E. Galvanized pipe shall be used for drain pipe.

F. System shall be designed to facilitate flushing of all cross mains and branch lines.

2.2 STEEL PIPE AND FITTINGS

A. Pipe shall be new, rated for 175 psi working pressure, Schedule 40 Black-Steel Pipe: conforming to ASTM A 53 for welded and seamless steel pipe. Pipe ends may be factory or field formed to match joining method. Pipe shall have the manufacturer’s name and brand along with the applicable ASTM standards marked on each length of pipe.

B. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.

C. Galvanized, Steel Couplings: ASTM A 865, threaded.

D. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

E. Malleable- or Ductile-Iron Unions: UL 860.

F. Cast-Iron Flanges: ASME 16.1, Class 125.

G. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.

H. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.

I. Grooved-Joint, Steel-Pipe Appurtenances:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Anvil International, Inc.
   b. Tyco Fire & Building Products LP.
   c. Victaulic Company.
2. Pressure Rating: 175 psig minimum.
3. Galvanized, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.3 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free.
1. Class 125, Cast-Iron Flat-Face Flanges: Full-face gaskets.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 LISTED FIRE-PROTECTION VALVES

A. General Requirements:
1. Valves shall be UL listed or FM approved.
2. Minimum Pressure Rating: 175 psig.

B. Check Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Anvil International, Inc.
   b. Crane Co.; Crane Valve Group; Stockham Division.
   c. Reliable Automatic Sprinkler Co., Inc.
   d. United Brass Works, Inc.
   e. Victaulic Company.
   f. Viking Corporation.
2. Standard: UL 312.
3. Pressure Rating: 250 psig minimum.
4. Type: Swing check.
5. Body Material: Cast iron.
6. End Connections: Flanged or grooved.

C. Iron OS&Y Gate Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Co.; Crane Valve Group; Stockham Division.
b. Milwaukee Valve Company.
c. United Brass Works, Inc.
2. Standard: UL 262.
3. Pressure Rating: 250 psig minimum.
4. Body Material: Cast or ductile iron.
5. End Connections: Flanged or grooved.

2.5 TRIM AND DRAIN VALVES

A. General Requirements:
1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Minimum Pressure Rating: 175 psig.

B. Ball Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Anvil International, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Milwaukee Valve Company.
d. Victaulic Company.

2.6 SPECIALTY VALVES

A. General Requirements:
1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Minimum Pressure Rating: 175 psig.
3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

B. Alarm Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFAC Inc.
b. Reliable Automatic Sprinkler Co., Inc.
c. Victaulic Company.
d. Viking Corporation.
2. Standard: UL 193.
3. Design: For horizontal or vertical installation.
4. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, and fill-line attachment with strainer.
5. Drip Cup Assembly: Pipe drain without valves and separate from main drain piping.
6. Drip Cup Assembly: Pipe drain with check valve to main drain piping.

C. Automatic (Ball Drip) Drain Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AFAC Inc.
b. Reliable Automatic Sprinkler Co., Inc.
c. Tyco Fire & Building Products LP.
2. Standard: UL 1726.
3. Pressure Rating: 175 psig minimum.
4. Type: Automatic draining, ball check.
5. Size: NPS 3/4.
6. End Connections: Threaded.

2.7 SPRINKLER SPECIALTY PIPE FITTINGS

A. Branch Outlet Fittings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Anvil International, Inc.
b. Tyco Fire & Building Products LP.
c. Victaulic Company.
2. Standard: UL 213.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
5. Type: Mechanical-T and -cross fittings.
6. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
7. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
8. Branch Outlets: Grooved, plain-end pipe, or threaded.

B. Flow Detection and Test Assemblies:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AGF Manufacturing Inc.
b. Reliable Automatic Sprinkler Co., Inc.
c. Tyco Fire & Building Products LP.
d. Victaulic Company.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

C. Sprinkler Inspector's Test Fittings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AGF Manufacturing Inc.
b. Tyco Fire & Building Products LP.
c. Victaulic Company.
d. Viking Corporation.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with sight glass.
5. Size: Same as connected piping.

6. Inlet and Outlet: Threaded.

2.8 SPRINKLERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Globe Fire Sprinkler Corporation.
2. Reliable Automatic Sprinkler Co., Inc.
3. Victaulic Company.
4. Viking Corporation.

B. General Requirements:
1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating for Automatic Sprinklers: 175 psig minimum.

C. Automatic Sprinklers with Heat-Responsive Element:
1. Early-Suppression, Fast-Response Applications: UL 1767.
2. Nonresidential Applications: UL 199.
3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.

D. Sprinkler Finishes:
1. Chrome plated.
2. Bronze.

E. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
1. Ceiling Mounting: Chrome-plated steel, one piece, flat.

F. Sprinkler Guards:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Reliable Automatic Sprinkler Co., Inc.
b. Tyco Fire & Building Products LP.
c. Victaulic Company.
d. Viking Corporation.
2. Standard: UL 199.
3. Type: Wire cage with fastening device for attaching to sprinkler.

2.9 ALARM DEVICES

A. Alarm-device types shall match piping and equipment connections.

B. Water-Motor-Operated Alarm:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Globe Fire Sprinkler Corporation.
b. Tyco Fire & Building Products LP.
c. Victaulic Company.

d. Viking Corporation.
2. Standard: UL 753.
3. Type: Mechanically operated, with Pelton wheel.
4. Alarm Gong: Cast aluminum with red-enamel factory finish.
5. Size: 10-inch diameter.
6. Components: Shaft length, bearings, and sleeve to suit wall construction.
7. Inlet: NPS 3/4.
8. Outlet: NPS 1 drain connection.

C. Water-Flow Indicators:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ADT Security Services, Inc.
b. McDonnell & Miller; ITT Industries.
c. Potter Electric Signal Company.
d. System Sensor; a Honeywell company.
e. Viking Corporation.
2. Standard: UL 346.
3. Water-Flow Detector: Electrically supervised.
4. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
5. Type: Paddle operated.
6. Pressure Rating: 250 psig.
7. Design Installation: Horizontal or vertical.

D. Valve Supervisory Switches:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Fire-Lite Alarms, Inc.; a Honeywell company.
b. Kennedy Valve; a division of McWane, Inc.
c. Potter Electric Signal Company.
d. System Sensor; a Honeywell company.
2. Standard: UL 346.
3. Type: Electrically supervised.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design: Signals that controlled valve is in other than fully open position.

2.10 PRESSURE GAGES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AMETEK; U.S. Gauge Division.
2. Ashcroft, Inc.
3. Brecco Corporation.
4. WIKA Instrument Corporation.

B. Standard: UL 393.

C. Dial Size: 3-1/2- to 4-1/2-inch diameter.

D. Pressure Gage Range: 0 to 300 psig.

E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.

2.11 ESCUTCHEONS

A. General: Manufactured ceiling, floor, and wall escutcheons and floor plates.

B. One-Piece, Deep-Pattern Escutcheons: Deep-drawn, box-shaped brass with chrome-plated finish.

C. One-Piece, Stamped-Steel Escutcheons: Chrome-plated finish with spring clips.

D. Split-Plate, Stamped-Steel Escutcheons: Chrome-plated finish with concealed hinge, spring clips.

2.12 SLEEVES

A. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

B. Molded-PE Sleeves: Reusable, PE, tapered-cup shaped, and smooth outer surface with nailing

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, standard weight, zinc coated, plain ends.

2.13 SLEEVE SEALS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products & Systems, Inc.
2. Calpico, Inc.
3. Metraflex, Inc.
4. Pipeline Seal and Insulator, Inc.

B. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Stainless steel.
3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.14 GROUT

A. Standard: ASTM C 1107, Grade B, posthardening and volume adjusting, dry, hydraulic-cement grout.

B. Characteristics: Nonshrink, and recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SERVICE-ENTRANCE PIPING

A. Connect sprinkler piping to water-service piping for service entrance to building. Comply with requirements for exterior piping in Division 21 Section "Facility Fire-Suppression Water-Service Piping."

B. Install shutoff valve, pressure gage, drain, and other accessories indicated at connection to water-service piping.

C. Install shutoff valve, check valve, pressure gage, and drain at connection to water service.

3.2 WATER-SUPPLY CONNECTIONS

A. Connect sprinkler piping to building's interior water-distribution piping. Comply with requirements for interior piping in Division 22 Section "Domestic Water Piping."

B. Install shutoff valve, pressure gage, drain, and other accessories indicated at connection to water-distribution piping.

C. Install shutoff valve, check valve, pressure gage, and drain at connection to water supply.

3.3 PIPING INSTALLATION

A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
   1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.

B. Piping Standard: Comply with requirements for installation of sprinkler piping in NFPA 13.

C. Install seismic restraints on piping. Comply with requirements for seismic-restraint device materials and installation in NFPA 13.

D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

E. Install unions adjacent to each valve in pipes NPS 2 and smaller.

F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.

H. Install sprinkler piping with drains for complete system drainage.

I. Install alarm devices in piping systems.

J. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.

K. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

L. Fill sprinkler system piping with water.

M. Install electric heating cables and pipe insulation on sprinkler piping in areas subject to freezing. Comply with requirements for heating cables in Division 21 "Heat Tracing for Fire-Suppression Piping" and for piping insulation in Division 21 Section "Fire-Suppression Systems Insulation."

3.4 JOINT CONSTRUCTION

A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.

B. Install unions adjacent to each valve in pipes NPS 2 and smaller.

C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.

G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

H. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
   1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.

I. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.

J. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 VALVE AND SPECIALTIES INSTALLATION

A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.

B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.

C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.

D. Specialty Valves:
1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
2. Alarm Valves: Include bypass check valve and retarding chamber drain-line connection.

3.6 SPRINKLER INSTALLATION

A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.

B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.

3.7 ESCUTCHEON INSTALLATION

A. Install escutcheons for penetrations of walls, ceilings, and floors.

B. Escutcheons for New Piping:
1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.
2. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, stamped steel with spring clips.
3. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece or split plate, stamped steel with set-screw.
4. Bare Piping in Unfinished Service Spaces: One piece, stamped steel with spring clips.
5. Bare Piping in Equipment Rooms: One piece, stamped steel with spring clips.
6. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece floor plate.

3.8 SLEEVE INSTALLATION

A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in floors, partitions, roofs, and walls.

B. Sleeves are not required for core-drilled holes.

C. Cut sleeves to length for mounting flush with both surfaces unless otherwise indicated.

D. Install sleeves in new partitions, slabs, and walls as they are built.

E. For interior wall penetrations, seal annular space between sleeve and pipe or pipe insulation using joint sealants appropriate for size, depth, and location of joint. Comply with requirements for joint sealants in Division 07 Section "Joint Sealants."

F. For exterior wall penetrations above grade, seal annular space between sleeve and pipe using joint sealants appropriate for size, depth, and location of joint. Comply with requirements for joint sealants in Division 07 Section "Joint Sealants."

G. For exterior wall penetrations below grade, seal annular space between sleeve and pipe using sleeve seals.

H. Seal space outside of sleeves in concrete slabs and walls with grout.

I. Install sleeves that are large enough to provide 1-inch annular clear space between sleeve and pipe or pipe insulation unless otherwise indicated.

J. Install sleeve materials according to the following applications:
   1. Sleeves for Piping Passing through Concrete Floor Slabs: Galvanized-steel pipe.
   2. Sleeves for Piping Passing through Concrete Floor Slabs of Mechanical Equipment Areas or Other Wet Areas: Galvanized-steel pipe.
      a. Extend sleeves 2 inches above finished floor level.
      b. For pipes penetrating floors with membrane waterproofing, extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Comply with requirements for flashing in Division 07 Section "Sheet Metal Flashing and Trim."
   3. Sleeves for Piping Passing through Gypsum-Board Partitions:
      a. Galvanized-steel-pipe sleeves for pipes smaller than NPS 6.
      b. Galvanized-steel-sheet sleeves for pipes NPS 6 and larger.
      c. Exception: Sleeves are not required for water-supply tubes and waste pipes for individual plumbing fixtures if escutcheons will cover openings.
   4. Sleeves for Piping Passing through Concrete Roof Slabs: Galvanized-steel pipe.
   5. Sleeves for Piping Passing through Exterior Concrete Walls:
      a. Galvanized-steel-pipe sleeves for pipes smaller than NPS 6.
      b. Cast-iron wall-pipe sleeves for pipes NPS 6 and larger.
      c. Install sleeves that are large enough to provide 1-inch annular clear space between sleeve and pipe or pipe insulation when sleeve seals are used.
   6. Sleeves for Piping Passing through Interior Concrete Walls:
      a. Galvanized-steel-pipe sleeves for pipes smaller than NPS 6.
      b. Galvanized-steel-sheet sleeves for pipes NPS 6 and larger.

K. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestop materials and installations in Division 07 Section "Penetration Firestopping."

3.9 SLEEVE SEAL INSTALLATION

A. Install sleeve seals in sleeves in exterior concrete walls at water-service piping entries into building.

B. Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble sleeve seal components and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.10 IDENTIFICATION

A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.

B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.11 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
4. Energize circuits to electrical equipment and devices.
5. Coordinate with fire-alarm tests. Operate as required.

C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.12 CLEANING

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers with paint other than factory finish.

3.13 PIPING SCHEDULE

A. Piping between Fire-Department Connections and Check Valves: Galvanized, standard-weight steel pipe with grooved ends; grooved-end fittings; grooved-end-pipe couplings; and grooved joints.

B. Sprinkler specialty fittings may be used, downstream of control vales, instead of specified fittings.

C. Wet-pipe sprinkler system, NPS 2 and smaller, shall be one of the following:
1. Standard-weight Schedule 40, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Standard-weight Schedule 40, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
3. Standard-weight Schedule 40, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
4. Standard-weight Schedule 40, black-steel pipe with plain ends; steel welding fittings; and welded joints.

D. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 to NPS 6, shall be one of the following:
1. Standard-weight Schedule 40, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Standard-weight Schedule 40, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
3. Standard-weight Schedule 40, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
4. Standard-weight Schedule 40, black-steel pipe with plain ends; steel welding fittings; and welded joints.

3.14 SPRINKLER SCHEDULE

A. Use sprinkler types in subparagraphs below for the following applications:
1. Rooms without Ceilings: Upright sprinklers.
2. Rooms with Suspended Ceilings: Recessed and concealed sprinklers as indicated.
3. Wall Mounting: Sidewall sprinklers.
4. Special Applications: Extended-coverage, flow-control, and quick-response sprinklers where indicated.

B. Provide sprinkler types in subparagraphs below with finishes indicated.
1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
2. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
3. Upright Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view.
4.

END OF SECTION

SECTION 22 05 00 – COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Piping materials and installation instructions common to most piping systems.
2. Dielectric fittings.
3. Mechanical sleeve seals.
4. Sleeves.
5. Escutcheons.
6. Equipment installation requirements common to equipment sections.
7. Concrete bases.
8. Supports and anchorages.

1.2 DEFINITIONS

A. Finished Spaces: Spaces other than plumbing and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and plumbing equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

A. Welding certificates.

1.4 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 22 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 22 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.

E. Welding Filler Metals: Comply with AWS D10.12.

2.3 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.

D. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

E. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.4 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

C. Pressure Plates: Carbon steel. Include two for each sealing element.

D. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.5 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with set screws.

E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.

F. PVC Pipe: ASTM D 1785, Schedule 40.

G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.6 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.
1. Finish: Polished chrome-plated.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
1. Finish: Polished chrome-plated.

PART 3 - EXECUTION

3.1 PLUMBING DEMOLITION

E. Refer to Division 01 Section "Cutting and Patching" and Division 02 Section "Selective Structure Demolition" for general demolition requirements and procedures.

F. Disconnect, demolish, and remove plumbing systems, equipment, and components indicated to be removed.
   1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

G. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, ceilings, and floors.

M. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

N. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Install steel pipe for sleeves smaller than 6 inches in diameter.
2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size.

Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

O. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

P. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

Q. Verify final equipment locations for roughing-in.

R. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.6 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to supported equipment.
6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 05 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.8 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

END OF SECTION

SECTION 22 05 23 – GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following general-duty valves:
   1. Copper-alloy ball valves.
   2. Bronze gate valves.

B. See Division 21 fire-suppression piping and fire pump Sections for fire-protection valves.

C. See Division 22 piping Sections for specialty valves applicable to those Sections only.

1.2 SUBMITTALS

A. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; furnished specialties; and accessories.

1.3 QUALITY ASSURANCE

A. ASME Compliance for Ferrous Valves: ASME B16.10 and ASME B16.34 for dimension and design criteria.

B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
   2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 VALVES, GENERAL

A. Refer to Part 3 "Valve Applications" Article for applications of valves.

B. Bronze Valves: NPS 2 and Smaller: Threaded ends, unless otherwise indicated.

C. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream pipe, unless otherwise indicated.

D. Valve Actuators:
1. Handwheel: For valves other than quarter-turn types.
2. Lever Handle: For quarter-turn valves NPS 6 and smaller, except plug valves.

F. Extended Valve Stems: On insulated valves.

G. Valve Flanges: ASME B16.1 for cast-iron valves, ASME B16.5 for steel valves, and ASME B16.24 for bronze valves.

H. Valve Grooved Ends: AWWA C606.
1. Solder Joint: With sockets according to ASME B16.18.
a. Caution: Use solder with melting point below 840 deg F for angle, check, gate, and globe valves; below 421 deg F for ball valves.
2. Threaded: With threads according to ASME B1.20.1.

I. Valve Bypass and Drain Connections: MSS SP-45.

2.3 COPPER-ALLOY BALL VALVES

A. Manufacturers:
1. Two-Piece, Copper-Alloy Ball Valves:
a. Conbraco Industries, Inc.; Apollo Div.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Hammond Valve.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Watts Industries, Inc.; Water Products Div.

B. Copper-Alloy Ball Valves, General: MSS SP-110.

C. Two-Piece, Copper-Alloy Ball Valves: Bronze body with full-port, chrome-plated bronze ball; PTFE or TFE seats; and 600-psig minimum CWP rating and blowout-proof stem.

2.4 BRONZE GATE VALVES

A. Manufacturers:
1. Type 2, Bronze, Rising-Stem, Solid-Wedge Gate Valves:
a. Crane Co.; Crane Valve Group; Crane Valves.
b. Hammond Valve.
c. Milwaukee Valve Company.
d. NIBCO INC.

B. Bronze Gate Valves, General: MSS SP-80, with ferrous-alloy handwheel.

C. Type 2, Class 150, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge and union-ring bonnet.

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

A. Refer tp piping Sections for specific valve applications. If valve applications are not indicated, use the following:
   1. Shutoff Service: Ball or gate valves.
   2. Throttling Service: Ball valves.

B. If valves with specified CWP ratings are not available, the same types of valves with higher CWP ratings may be substituted.

C. Domestic Water Piping: Use the following types of valves:
   1. Ball Valves, NPS 2 and Smaller: Two-piece, 600-psig CWP rating, copper alloy.
   2. Gate Valves, NPS 2 and Smaller: Type 2, Class 150, bronze.

D. Select valves, except wafer and flangeless types, with the following end connections:
   1. For Copper Tubing, NPS 2 and Smaller: Solder-joint or threaded ends.
   2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged or threaded ends.
   3. For Steel Piping, NPS 2 and Smaller: Threaded ends.
   4. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged or threaded ends.

3.2 VALVE INSTALLATION

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

C. Locate valves for easy access and provide separate support where necessary.

D. Install valves in horizontal piping with stem at or above center of pipe.

E. Install valves in position to allow full stem movement.

F. Install check valves for proper direction of flow and as follows:
   1. Swing Check Valves: In horizontal position with hinge pin level.
   2. Dual-Plate Check Valves: In horizontal or vertical position, between flanges.
   3. Lift Check Valves: With stem upright and plumb.

3.3 JOINT CONSTRUCTION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.

B. Grooved Joints: Assemble joints with keyed coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.4 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION

SECTION 22 05 29 – HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Equipment supports.

B. See Division 05 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

C. See Division 21 Section "Water-Based Fire-Suppression Systems" for pipe hangers for fire-suppression piping.

1.2 DEFINITIONS

A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.4 SUBMITTALS

A. Product Data: For the following:
1. Steel pipe hangers and supports.
2. Thermal-hanger shield inserts.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
1. Trapeze pipe hangers. Include Product Data for components.
2. Metal framing systems. Include Product Data for components.
3. Equipment supports.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

B. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

B. Manufacturers:
1. AAA Technology & Specialties Co., Inc.
2. Bergen-Power Pipe Supports.
3. B-Line Systems, Inc.; a division of Cooper Industries.
4. Carpenter & Paterson, Inc.
5. Empire Industries, Inc.
6. ERICO/Michigan Hanger Co.
7. Globe Pipe Hanger Products, Inc.
8. Grinnell Corp.
9. GS Metals Corp.
10. National Pipe Hanger Corporation.
11. PHD Manufacturing, Inc.
12. PHS Industries, Inc.
13. Piping Technology & Products, Inc.
14. Tolco Inc.

C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

B. Manufacturers:
1. B-Line Systems, Inc.; a division of Cooper Industries.
2. Tolco Inc.
3. Unistrut Corp.; Tyco International, Ltd.

C. Coatings: Pregalvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.5 THERMAL-HANGER SHIELD INSERTS

A. Description: 100-psig- minimum, compressive-strength insulation insert encased in sheet metal shield.

B. Manufacturers:
1. Carpenter & Paterson, Inc.
2. ERICO/Michigan Hanger Co.
3. PHS Industries, Inc.
4. Pipe Shields, Inc.
5. Rilco Manufacturing Company, Inc.
6. Value Engineered Products, Inc.

C. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass with vapor barrier.

D. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.

E. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

F. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

G. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.6 FASTENER SYSTEMS

A. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
a. B-Line Systems, Inc.; a division of Cooper Industries.
b. Hilti, Inc.
c. ITW Ramset/Red Head.

2.7 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.8 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

C. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

D. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

E. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.

F. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

G. Use padded hangers for piping that is subject to scratching.

H. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F pipes, NPS 4 to NPS 16, requiring up to 4 inches of insulation.
3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24, requiring clamp flexibility and up to 4 inches of insulation.
4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
5. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.
6. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange.
7. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30, from 2 rods if longitudinal movement caused by expansion and contraction might occur.
8. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42, if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

I. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.

J. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.

K. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
   3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   6. C-Clamps (MSS Type 23): For structural shapes.
   7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      a. Light (MSS Type 31): 750 lb.
      b. Medium (MSS Type 32): 1500 lb.
      c. Heavy (MSS Type 33): 3000 lb.
   8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
   9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

L. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
   2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
   3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

M. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
   2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
   3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.

N. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.

O. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.

P. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.

D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

E. Fastener System Installation:
1. Install powder-actuated fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

F. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

I. Install lateral bracing with pipe hangers and supports to prevent swaying.

J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

K. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

M. Insulated Piping: Comply with the following:
1. Attach clamps and spacers to piping.
   a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
   b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
   c. Do not exceed pipe stress limits according to ASME B31.9 for building services piping.
2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
4. Shield Dimensions for Pipe: Not less than the following:
   a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
   b. NPS 4: 12 inches long and 0.06 inch thick.
   c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
   d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
   e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
5. Pipes NPS 8 and Larger: Include wood inserts.
6. Insert Material: Length at least as long as protective shield.
7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.6 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 22 05 48 – VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Isolation pads.
2. Isolation mounts.
3. Restrained elastomeric isolation mounts.
4. Freestanding and restrained spring isolators.
5. Housed spring mounts.
6. Elastomeric hangers.
7. Spring hangers.
8. Spring hangers with vertical-limit stops.
9. Pipe riser resilient supports.
10. Resilient pipe guides.
11. Seismic snubbers.
12. Restraining braces and cables.

1.2 PERFORMANCE REQUIREMENTS

A. Seismic-Restraint Loading:
1. In accordance with ASCE 7-10 Section 13.6 and Table 13.6-1.

1.3 SUBMITTALS

B. A. Product Data: For the following:
1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated in accordance with ASCE 7-10 Section 13.6 and Table 13.6-1.
b. Annotate to indicate application of each product submitted and compliance with requirements.
3. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.

B. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators, seismic restraints, and for designing vibration isolation bases.
2. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, spring deflection changes, and seismic loads. Include certification that riser system has been examined for excessive stress and that none will exist.
3. Vibration Isolation Base Details: Detail overall dimensions, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides

and rails, base weights, equipment static loads, power transmission, component misalignment, and cantilever loads.

4. Seismic-Restraint Details:
   a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
   b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
   c. Preapproval and Evaluation Documentation: By OSHPD an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

B. Coordination Drawings: Show coordination of seismic bracing for plumbing piping and equipment with other systems and equipment in the vicinity, including other supports and seismic restraints.

C. Welding certificates.

D. Qualification Data: For professional engineer and testing agency.

E. Field quality-control test reports.

F. Operation and Maintenance Data: For air-mounting systems to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

C. C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproved by ICC-ES, or preapproved by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. California Dynamics Corporation.
2. Isolation Technology, Inc.
3. Mason Industries.
4. Vibration Isolation.

B. Pads: Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
1. Resilient Material: Oil- and water-resistant neoprene.

B. C. Double-deflection type, with molded, oil-resistant rubber, hermetically sealed compressed fiberglass, or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and with baseplate for bolting to structure. Color-code or otherwise identify to indicate capacity range.
1. Materials: Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
2. Neoprene: Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.

A. Restrained Mounts: All-directional mountings with seismic restraint.
1. Materials: Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
2. Neoprene: Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.

B. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch- thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig.
6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

C. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- thick, neoprene

or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
2. Restraint: Seismic or limit-stop as required for equipment and authorities having jurisdiction.
3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

A. Housed Spring Mounts: Housed spring isolator with integral seismic snubbers.
1. Housing: Ductile-iron or steel housing to provide all-directional seismic restraint.
2. Base: Factory drilled for bolting to structure.
3. Snubbers: Vertically adjustable to allow a maximum of 1/4-inch travel up or down before contacting a resilient collar.

A. Elastomeric Hangers: Single or double-deflection type, fitted with molded, oil-resistant elastomeric isolator elements bonded to steel housings with threaded connections for hanger rods. Color-code or otherwise identify to indicate capacity range.

B. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.
1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
7. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

J. Spring Hangers with Vertical-Limit Stop: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression and with a vertical-limit stop.
1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
8. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

K. Pipe Riser Resilient Support: All-directional, acoustical pipe anchor consisting of 2 steel tubes separated by a minimum of 1/2-inch- thick neoprene. Include steel and neoprene vertical-limit stops arranged to prevent vertical travel in both directions. Design support for a maximum load on the isolation material of 500 psig and for equal resistance in all directions.

L. Resilient Pipe Guides: Telescopic arrangement of 2 steel tubes or post and sleeve arrangement separated by a minimum of 1/2-inch- thick neoprene. Where clearances are not readily visible, a factory-set guide height with a shear pin to allow vertical motion due to pipe expansion and contraction shall be fitted. Shear pin shall be removable and reinsertable to allow for selection of pipe movement. Guides shall be capable of motion to meet location requirements.

2.2 VIBRATION ISOLATION EQUIPMENT BASES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. California Dynamics Corporation.
2. Isolation Technology, Inc.
3. Mason Industries.
4. Vibration Isolation.

B. Steel Base: Factory-fabricated, welded, structural-steel bases and rails.
1. Design Requirements: Lowest possible mounting height with not less than 1-inch clearance above the floor. Include equipment anchor bolts and auxiliary motor slide bases or rails.
   a. Include supports for suction and discharge elbows for pumps.
2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Bases shall have shape to accommodate supported equipment.
3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.

C. Inertia Base: Factory-fabricated, welded, structural-steel bases and rails ready for placement of cast-in-place concrete.
1. Design Requirements: Lowest possible mounting height with not less than 1-inch clearance above the floor. Include equipment anchor bolts and auxiliary motor slide bases or rails.
   a. Include supports for suction and discharge elbows for pumps.
2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Bases shall have shape to accommodate supported equipment.
3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.
4. Fabrication: Fabricate steel templates to hold equipment anchor-bolt sleeves and anchors in place during placement of concrete. Obtain anchor-bolt templates from supported equipment manufacturer.

2.3 SEISMIC-RESTRAINT DEVICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Cooper B-Line, Inc.; a division of Cooper Industries.

2. Hilti, Inc.
3. Mason Industries.
4. TOLCO Incorporated; a brand of NIBCO INC.
5. Unistrut; Tyco International, Ltd.

B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by OSHPD an agency acceptable to authorities having jurisdiction.
1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.

C. Snubbers: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.
1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.
2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
3. Maximum 1/4-inch air gap, and minimum 1/4-inch- thick resilient cushion.

C. D. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.

D. E. Restraint Cables: ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

E. F. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

F. G. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

G. H. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

H. I. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

I. J. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.

J.

K. K. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.4 FACTORY FINISHES

A. Finish: Manufacturer's standard prime-coat finish ready for field painting.

L. B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
1. Powder coating on springs and housings.
2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
3. Baked enamel or powder coat for metal components on isolators for interior use.
4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by OSHPD an agency acceptable to authorities having jurisdiction.

B. B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

C. C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Equipment Restraints:
1. Install seismic snubbers on plumbing equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inches.
3. Install seismic-restraint devices using methods approved by OSHPD an agency acceptable to authorities having jurisdiction providing required submittals for component.

B. Piping Restraints:
   1. Comply with requirements in MSS SP-127.
   2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
   3. Brace a change of direction longer than 12 feet.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install seismic-restraint devices using methods approved by OSHPD an agency acceptable to authorities having jurisdiction providing required submittals for component.

E. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

F. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

G. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

H. Drilled-in Anchors:
   1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
   2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
   3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
   4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
   5. Set anchors to manufacturer's recommended torque, using a torque wrench.
   6. Install zinc-coated steel anchors for interior and stainless steel anchors for exterior applications.

3.3 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Division 15 Section "Domestic Water Piping" for piping flexible connections.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. B. Perform tests and inspections.

C. C. Tests and Inspections:
1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. Measure isolator restraint clearance.
7. Measure isolator deflection.
8. Verify snubber minimum clearances.
9. Air-Mounting System Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
10. Air-Mounting System Operational Test: Test the compressed-air leveling system.
11. Test and adjust air-mounting system controls and safeties.
12. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

C. Adjust active height of sprint isolators.

D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION

SECTION 22 05 53 – IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Stencils.
5. Valve tags.
6. Warning tags.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For color, letter style, and graphic representation required for each identification material and device.

C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

D. Valve numbering scheme.

E. Valve Schedules: For each piping system to include in maintenance manuals.

1.3 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:
1. Material and Thickness: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger

lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

4. Fasteners: Stainless-steel self-tapping screws.
5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: White Yellow Insert color.
3. Background Color: Black.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: Red.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1-1/2 inches high.

2.4 STENCILS

A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; and minimum letter height of 3/4 inch for access panel and door labels, equipment labels, and similar operational instructions.
1. Stencil Material: Fiberboard.
2. Stencil Paint: Exterior, gloss, acrylic enamel black unless otherwise indicated. Paint may be in pressurized spray-can form.
3. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated.

2.5 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
1. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
2. Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
1. Size: 3 by 5-1/4 inches minimum.

2. Fasteners: Brass grommet and wire.
3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Piping Color-Coding: Painting of piping is specified in Division 9 Section "Interior Painting."

B. Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, on each piping system.
1. Identification Paint: Use for contrasting background.
2. Stencil Paint: Use for pipe marking.

C. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

D. Pipe Label Color Schedule:
1. Condensate Piping:
   a. Background Color: Yellow.
   b. Letter Color: Black.
2. Natural Gas Piping:
   a. Background Color: Yellow.
   b. Letter Color: Black.
3. Domestic Water Piping:

a. Background Color: Black.
b. Letter Color: Yellow.

4. Sanitary Waste, Vent and Storm Drainage Piping:
a. Background Color: Yellow.
b. Letter Color: Black.

3.4 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
1. Valve-Tag Size and Shape:
a. Cold Water: 2 inches, round.
b. Hot Water: 2 inches, round.
2. Valve-Tag Color:
a. Cold Water: Natural.
b. Hot Water: Natural.
3. Letter Color:
a. Cold Water: Black.
b. Hot Water: Black.

3.5 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION

SECTION 22 07 00 – PLUMBING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Insulation Materials:
      a. Mineral fiber.
   2. Insulating cements.
   3. Adhesives.
   4. Sealants.
   5. Factory-applied jackets.
   6. Tapes.
   7. Securements.

B. Related Sections include the following:
   1. Division 23 Section "HVAC Insulation."

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
   3. Detail removable insulation at piping specialties, equipment connections, and access panels.

C. Field quality-control reports.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

B. See "Product Characteristics" Article in Evaluations for comparisons and temperature ranges for insulation material properties.

C. Products shall not contain asbestos, lead, mercury, or mercury compounds.

D. Mineral-Fiber, Preformed Pipe Insulation:
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Johns Manville; Micro-Lok.
   b. Knauf Insulation; 1000 Pipe Insulation.
   c. Owens Corning; Fiberglas Pipe Insulation.
2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 INSULATING CEMENTS

A. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Insulco, Division of MFS, Inc.; SmoothKote.
   b. P. K. Insulation Mfg. Co., Inc.; PK No. 127, and Quik-Cote.
   c. Rock Wool Manufacturing Company; Delta One Shot.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Products, Division of ITW; CP-82.
   b. Foster Products Corporation, H. B. Fuller Company; 85-20.
   c. ITW TACC, Division of Illinois Tool Works; S-90/80.
   d. Marathon Industries, Inc.; 225.
   e. Mon-Eco Industries, Inc.; 22-25.

C. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Products, Division of ITW; CP-82.
   b. Foster Products Corporation, H. B. Fuller Company; 85-20.
   c. ITW TACC, Division of Illinois Tool Works; S-90/80.
   d. Marathon Industries, Inc.; 225.
   e. Mon-Eco Industries, Inc.; 22-25.

2.4 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-76-8.
b. Foster Products Corporation, H. B. Fuller Company; 95-44.
c. Marathon Industries, Inc.; 405.
d. Mon-Eco Industries, Inc.; 44-05.
e. Vimasco Corporation; 750.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.

B. Available ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.

2.5 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.6 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
b. Compac Corp.; 104 and 105.
c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
b. Compac Corp.; 110 and 111.
c. Ideal Tape Co., Inc., an American Biltrite Company; 491 AWF FSK.

d. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ.
2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.7 SECUREMENTS

A. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

PART 2 - PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

O. For above ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.3 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
   1. Seal penetrations with flashing sealant.
   2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
   3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
   4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
   1. Comply with requirements in Division 07 Section "Penetration Firestopping" and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:
   1. Pipe: Install insulation continuously through floor penetrations.
   2. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

3.4 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
   1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
   2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
   3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
   4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
   5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe.
      Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket.

Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.

6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.5 MINERAL-FIBER INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.

4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.6 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.7 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Hot and Recirculated Hot Water: Insulation shall be the following:
1. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

END OF SECTION

SECTION 22 11 16 – DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes domestic water piping inside the building.

B. Water meters will be furnished and installed by utility company.

C. See Division 22 Section "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and fittings.

D. See Division 22 Section "Domestic Water Piping Specialties" for water distribution piping specialties.

1.2 SUBMITTALS

A. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for potable domestic water piping and components.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

B. Refer to Part 3 "Pipe and Fitting Applications" Article for applications of pipe, tube, fitting, and joining materials.

C. Transition Couplings for Aboveground Pressure Piping: Coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

D. Soft Copper Tube: ASTM B 88, Types K and L, water tube, annealed temper.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends. Furnish Class 300 flanges if required to match piping.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

2.2 VALVES

A. Bronze and cast-iron, general-duty valves are specified in Division 22 Section "General-Duty Valves for Plumbing Piping."

B. Balancing and drain valves are specified in Division 22 Section "Domestic Water Piping Specialties."

PART 2 - EXECUTION

3.1 EXCAVATION

A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.2 PIPE AND FITTING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Under-Building-Slab, Water-Service Piping on Service Side of Water Meter: Refer to Division 22 Section "Facility Water Distribution Piping."

E. Domestic Water Piping on Service Side of Water Meter inside the Building: Use the following piping materials for each size range:

1. NPS 4 to NPS 6: Hard copper tube, Type L; copper pressure fittings; and soldered joints.

F. Under-Building-Slab, Domestic Water Piping on House Side of Water Meter, NPS 4 and Smaller: Hard copper tube, Type K; copper pressure fittings; and soldered joints.

G. Aboveground Domestic Water Piping: Use the following piping materials for each size range:

1. NPS 1 and Smaller: Hard copper tube, Type L; copper pressure fittings; and soldered joints.

3.3 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use bronze ball valves for piping NPS 2 and smaller. Use cast-iron butterfly or gate valves with flanged ends for piping NPS 2-1/2 and larger.
2. Throttling Duty: Use bronze ball valves for piping NPS 2 and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 and larger.
3. Hot-Water-Piping, Balancing Duty: Calibrated balancing valves.
4. Drain Duty: Hose-end drain valves.

B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.

C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
   1. Install hose-end drain valves at low points in water mains, risers, and branches.
   2. Install stop-and-waste drain valves where indicated.

D. Install calibrated balancing valves in each hot-water circulation return branch and discharge side of each pump and circulator. Set calibrated balancing valves partly open to restrict but not stop flow. Calibrated balancing valves are specified in Division 22 Section "Domestic Water Piping Specialties."

3.4 PIPING INSTALLATION

A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."

B. Install under-building-slab copper tubing according to CDA's "Copper Tube Handbook."

C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."

D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Pressure gages are specified in Division 22 Section "Meters and Gages for Plumbing Piping," and drain valves and strainers are specified in Division 22 Section "Domestic Water Piping Specialties."

E. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.

F. Rough-in domestic water piping for water-meter installation according to utility company's requirements.

3.5 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."

B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.6 ROUGHING-IN FOR WATER METERS

A. Rough-in domestic water piping for water meter installation according to utility company's requirements.

B. Water meters will be furnished and installed by utility.

3.7 HANGER AND SUPPORT INSTALLATION

A. Pipe hanger and support devices are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
   1. Vertical Piping: MSS Type 8 or Type 42, clamps.
   2. Individual, Straight, Horizontal Piping Runs: According to the following:
      a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
      b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
      c. Longer Than 100 Feet: MSS Type 49, spring cushion rolls, if indicated.
   3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
   4. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch.

E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
   2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
   3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
   4. NPS 2-1/2: 108 inches with 1/2-inch rod.
   5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
   6. NPS 6: 10 feet with 5/8-inch rod.

F. Install supports for vertical copper tubing every 10 feet.

G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.8 CONNECTIONS

A. Install piping adjacent to equipment and machines to allow service and maintenance.

B. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

C. Connect domestic water piping to water-service piping with shutoff valve, and extend and connect to the following:
   1. Booster Pumps: Cold-water suction and discharge piping.
   2. Water Heaters: Cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
   3. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Plumbing Fixtures."

4. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.9 FIELD QUALITY CONTROL

A. Inspect domestic water piping as follows:
1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
   a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
   b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test domestic water piping as follows:
1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.10 CLEANING

A. Clean and disinfect potable domestic water piping using purging and disinfecting procedures prescribed by authorities having jurisdiction.

B. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

C. Prepare and submit reports of purging and disinfecting activities.

END OF SECTION

SECTION 22 11 19 – DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL`

1.1 SUMMARY

A. This Section includes the following domestic water piping specialties:
   1. Vacuum breakers.
   2. Hose bibbs.
   3. Water hammer arresters.
   4. Trap-seal primer valves.

B. See Division 22 Section "Domestic Water Piping" for water meters.

C. See Division 22 Section "Drinking Fountains and Water Coolers" for water filters for water coolers.

1.2 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig, unless otherwise indicated.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. NSF Compliance:
   1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
   2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

B. Hose-Connection Vacuum Breakers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Chicago Faucets
      b. Arrowhead Brass Products, Inc.
      c. MIFAB, Inc.

d. Watts Industries, Inc.; Water Products Div.
e. Zurn Plumbing Products Group; Light Commercial Operation.
f. Zurn Plumbing Products Group; Wilkins Div.
2. Standard: ASSE 1001.
3. Body: Bronze, non-removable, with manual drain.
4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
5. Finish: Chrome or nickel plated.

2.2 HOSE BIBBS

A. Hose Bibbs HB-1 and HB-2:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: (Refer to plans for model number)
a. Acorn Engineering
b. MIFAB, Inc.
c. Smith, Jay R. Mfg. Co.; Divisions of Smith Industries, Inc.
d. Zurn Plumbing Products Group; Light Commercial Operation.
2. Standard: ASME A112.18.1 for sediment faucets.
3. Body Material: Bronze.
4. Seat: Bronze, replaceable.
5. Supply Connections: NPS 1/2 or NPS 3/4 threaded or solder-joint inlet.
6. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
7. Pressure Rating: 125 psig.
8. Vacuum Breaker: Integral non-removable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
9. Finish for Equipment Rooms: Rough chrome finish.
10. Finish for Service Areas: Rough chrome finish.
11. Finish for Finished Rooms: Polished chrome finish.
12. Operation for Equipment Rooms: Operating key.
13. Operation for Service Areas: Operating key.
14. Operation for Finished Rooms: Operating key.
15. Include operating key with each operating-key hose bibb.
16. Include wall flange with each chrome- or nickel-plated hose bibb.

2.3 WATER HAMMER ARRESTERS

A. Water Hammer Arresters WHA-1:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: (Refer to plans for model number)
a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
b. MIFAB, Inc.
c. AMTROL, Inc.
d. Josam Company.
e. Watts Drainage Products Inc.
f. Zurn Plumbing Products Group; Specification Drainage Operation
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.4 TRAP-SEAL PRIMER VALVES

A. Supply-Type, Trap-Seal Primer Valves TP-1:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: (Refer to plans for model number)
   a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   b. MIFAB, Inc.
   c. Watts Industries, Inc.; Water Products Div.
   d. PPP. Inc.
2. Standard: ASSE 1018.
3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

PART 2 - EXECUTION

3.1 INSTALLATION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
   1. Locate backflow preventers in same room as connected equipment or system.
   2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
   3. Do not install bypass piping around backflow preventers.

C. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.

D. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
   1. Install thermometers and water regulators if specified.
   2. Install cabinet-type units recessed in or surface mounted on wall as specified.

E. Install Y-pattern strainers for water on supply side of each water pressure-reducing valve,.

F. Install water hammer arresters in water piping according to PDI-WH 201.

G. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

H. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.

I. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
   1. Reduced-pressure-principle backflow preventers.
   2. Double-check backflow-prevention assemblies.
   3. Water pressure-reducing valves.
   4. Primary, thermostatic, water mixing valves.
   5. Supply-type, trap-seal primer valves.

J. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and prepare test reports:
   1. Test each reduced-pressure-principle backflow preventer and double-check backflow-prevention assembly according to authorities having jurisdiction and the device's reference standard.

B. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

3.3 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.

B. Set field-adjustable flow of balancing valves.

C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

END OF SECTION

SECTION 22 11 23 – FACILITY NATURAL-GAS PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pipes, tubes, and fittings.
2. Piping specialties.
3. Piping and tubing joining materials.
4. Valves.

1.2 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

1.3 PERFORMANCE REQUIREMENTS

A. Minimum Operating-Pressure Ratings:
1. Piping and Valves: 100 psig (690 kPa) minimum unless otherwise indicated.

B. Natural-Gas System Pressure within Buildings: 0.5 psig (3.45 kPa) or less.

1.4 SUBMITTALS

A. The contractor shall submit complete data as hereinafter specified. Said data, assembled in individual brochures, shall be submitted in seven (7) copies. Each item shall be identified by the paragraph number and page number as shown in the Specifications. Brochures shall be clearly labeled with project name and Architectural project number. Should corrections be necessary, the Contractor shall resubmit within fifteen (15) calendar days after the submittals are returned by the Architect

B. Product Data: For each type of the following:
1. Piping specialties.
2. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.

1.5 QUALITY ASSURANCE

A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store and handle pipes and tubes having factory-applied protective coatings to avoid damaging coating, and protect from direct sunlight.

C. Protect stored PE pipes and valves from direct sunlight.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Natural-Gas Service: Do not interrupt natural-gas service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide purging and startup of natural-gas supply according to requirements indicated:
1. Notify Architect Construction Manager Owner no fewer than five (5) working days in advance of proposed interruption of natural-gas service.
2. Do not proceed with interruption of natural-gas service without Architect's Construction Manager's and Owner's written permission.

1.8 COORDINATION

A. Coordinate sizes and locations of actual equipment provided.

B. Coordinate requirements for access panels and doors for valves installed concealed behind finished surfaces. Comply with requirements in Division 08 Section "Access Doors and Frames."

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

C. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40.
1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
4. Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and PE.
   a. Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.
5. Corrosion Control: Refer to Soil Corrosivity Study and Report for further requirements.

D. PE Pipe: ASTM D 2513, SDR 11.
   1. PE Fittings: ASTM D 2683, socket-fusion type or ASTM D 3261, butt-fusion type with dimensions matching PE pipe.
   2. PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D 2513, SDR 11; and steel pipe complying with ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.

2.2 PIPING SPECIALTIES

A. Appliance Flexible Connectors:
   1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
   2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
   3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
   4. Corrugated stainless-steel tubing with polymer coating.
   5. Operating-Pressure Rating: 0.5 psig (3.45 kPa).
   6. End Fittings: Zinc-coated steel.
   7. Threaded Ends: Comply with ASME B1.20.1.
   8. Maximum Length: 72 inches (1830 mm).

2.3 JOINING MATERIALS

A. Joint Compound and Tape: Suitable for natural gas.

B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 MANUAL GAS SHUTOFF VALVES

A. See "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles for where each valve type is applied in various services.

B. General Requirements for Metallic Valves, NPS 2 (DN 50) and Smaller: Comply with ASME B16.33.
   1. CWP Rating: 200 psig (862 kPa).
   2. Threaded Ends: Comply with ASME B1.20.1.
   3. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch (25 mm) and smaller.
   4. Service Mark: Valves 1-1/4 inches (32 mm) to NPS 2 (DN 50) shall have initials "WOG" permanently marked on valve body.

C. General Requirements for Metallic Valves, NPS 2-1/2 (DN 65) and Larger: Comply with ASME B16.38.
   1. CWP Rating: 200 psig (862 kPa).
   2. Flanged Ends: Comply with ASME B16.5 for steel flanges.
   3. Service Mark: Initials "WOG" shall be permanently marked on valve body.

D. Bronze Plug Valves: MSS SP-78.
   5. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Homestead.
      b. Walworth.
   6. Body: Bronze, complying with ASTM B 584.

7. Plug: Bronze.
8. Ends: Threaded, or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
9. Operator: Square head or lug type with tamperproof feature where indicated.
10. Pressure Class: 200 psig.
11. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
12. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

B. Cast-Iron, Lubricated Plug Valves: MSS SP-78.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Homestead Valve; a division of Olson Technologies, Inc.
   b. Walworth.
2. Body: Cast iron, complying with ASTM A 126, Class B.
3. Plug: Bronze or nickel-plated cast iron.
4. Seat: Coated with thermoplastic.
5. Stem Seal: Compatible with natural gas.
6. Ends: Threaded or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
7. Operator: Square head or lug type.
8. Pressure Class: 200 psig.
9. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

F. Valve Boxes:
1. Cast-iron, two-section box.
2. Top section with cover with "GAS" lettering.
3. Bottom section with base to fit over valve and barrel a minimum of 5 inches (125 mm) in diameter.
4. Adjustable cast-iron extensions of length required for depth of bury.
5. Include tee-handle, steel operating wrench with socket end fitting valve nut or flat head, and with stem of length required to operate valve.

2.5 EARTHQUAKE VALVES

A. Earthquake Valves: Comply with ASCE 25.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following: (Refer to plans for model number)
   a. KOSO.
   b. Pacific Seismic Products, Inc.
   3. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction.
4. Maximum Operating Pressure: 0.5 psig (3.45 kPa).
5. Cast-aluminum body with stainless-steel internal parts.
6. Nitrile-rubber, reset-stem o-ring seal.
7. Valve position, open or closed, indicator.
8. Composition valve seat with clapper held by spring or magnet locking mechanism.
9. Level indicator.

10. End Connections: Threaded for valves NPS 2 (DN 50) and smaller; flanged for valves NPS 2-1/2 (DN 65) and larger.

2.6 SLEEVES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

2.7 ESCUTCHEONS

A. General Requirements for Escutcheons: Manufactured wall and ceiling escutcheons and floor plates, with ID to fit around pipe or tube, and OD that completely covers opening.

B. One-Piece, Deep-Pattern Escutcheons: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Escutcheons: With set screw.
1. Finish: Polished chrome-plated.

D. Split-Casting, Cast-Brass Escutcheons: With concealed hinge and set screw.
1. Finish: Polished chrome-plated.

E. One-Piece, Stamped-Steel Escutcheons: With set screw and chrome-plated finish.

F. Split-Plate, Stamped-Steel Escutcheons: With exposed-rivet hinge, set screw, and chrome-plated finish.

G. One-Piece, Floor-Plate Escutcheons: Cast-iron floor plate.

H. Split-Casting, Floor-Plate Escutcheons: Cast brass with concealed hinge and set screw.

2.8 LABELING AND IDENTIFYING

A. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored yellow.

PART 3 - EXECUTION

3.1 EXAMINATION

B. Examine roughing-in for natural-gas piping system to verify actual locations of piping connections before equipment installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Close equipment shutoff valves before turning off natural gas to premises or piping section.

B. Inspect natural-gas piping according to NFPA 54 to determine that natural-gas utilization devices are turned off in piping section affected.

C. Comply with NFPA 54 requirements for prevention of accidental ignition.

3.3 OUTDOOR PIPING INSTALLATION

A. Comply with NFPA 54 for installation and purging of natural-gas piping.

B. Install underground, natural-gas piping buried at least 24 inches below finished grade. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

C. Install underground, PE, natural-gas piping according to ASTM D 2774.

D. Install fittings for changes in direction and branch connections.

E. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.

3.4 INDOOR PIPING INSTALLATION

A. Comply with NFPA 54 for installation and purging of natural-gas piping.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.

D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

G. Locate valves for easy access.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install escutcheons at penetrations of interior walls, ceilings, and floors.
   1. New Piping:
      a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
      b. Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
      c. Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
      d. Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished chrome-plated finish.
      e. Piping in Unfinished Service Spaces: One-piece, stamped-steel type with exposed-rivet hinge and set screw.
      f. Piping in Equipment Rooms: One-piece, cast-brass type.
      g. Piping in Equipment Rooms: One-piece, stamped-steel type with set screw.
      h. Piping at Floor Penetrations in Equipment Rooms: One-piece, floor-plate type.

K. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."

L. Verify final equipment locations for roughing-in.

M. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.

N. Conceal pipe installations in walls, pipe spaces and, utility spaces, above ceilings.
   1. Prohibited Locations:
      a. Do not install natural-gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
      b. Do not install natural-gas piping in solid walls or partitions.

O. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.

P. Connect branch piping from top or side of horizontal piping.

Q. Install unions in pipes NPS 2 (DN 50) and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.

R. Do not use natural-gas piping as grounding electrode.

3.5 VALVE INSTALLATION

A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.

B. Install underground valves with valve boxes.

C. Install earthquake valves outside buildings according to listing.

D. Install anode for metallic valves in underground PE piping.

3.6 PIPING JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints:
1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
2. Cut threads full and clean using sharp dies.
3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Welded Joints:
1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
2. Bevel plain ends of steel pipe.
3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

E. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
1. Plain-End Pipe and Fittings: Use butt fusion.
2. Plain-End Pipe and Socket Fittings: Use socket fusion.

3.7 HANGER AND SUPPORT INSTALLATION

A. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
1. NPS 1 (DN 25) and Smaller: Maximum span, 96 inches (2438 mm); minimum rod size, 3/8 inch (10 mm).
2. NPS 1-1/4 (DN 32): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).
3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).
4. NPS 2-1/2 to NPS 3-1/2 (DN 65 to DN 90): Maximum span, 10 feet (3 m); minimum rod size, 1/2 inch (13 mm).
5. NPS 4 (DN 100) and Larger: Maximum span, 10 feet (3 m); minimum rod size, 5/8 inch (15.8 mm).

3.8 CONNECTIONS

A. Connect to utility's gas main according to utility's procedures and requirements.

B. Install piping adjacent to appliances to allow service and maintenance of appliances.

C. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches (1800 mm) of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.

3.9 LABELING AND IDENTIFYING

A. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for piping and valve identification. Install detectable warning tape directly above gas piping, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.10 PAINTING

A. Comply with requirements in Division 09 painting Sections for painting interior and exterior natural-gas piping.

B. Paint exposed, exterior metal piping and valves, earthquake valves, and piping specialties, except components, with factory-applied paint or protective coating.
1. Alkyd System: MPI EXT 5.1D.
a. Prime Coat: Alkyd anticorrosive metal primer.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Exterior alkyd enamel (flat).
d. Color: Gray.

C. Damage and Touchup: Repair marred and damaged factory-applied finishes with materials and by procedures to match original factory finish.

3.11 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain earthquake valves.

3.12 OUTDOOR PIPING SCHEDULE

A. Underground natural-gas piping shall be the following:
1. PE pipe and fittings joined by heat fusion; service-line risers with tracer wire terminated in an accessible location.

B. Aboveground natural-gas piping shall be the following:
1. Steel pipe with malleable-iron fittings and threaded joints.

3.13 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG (3.45 kPa)

A. Aboveground, branch piping 2 inch and smaller shall be the following:
1. Schedule 40 Black Steel pipe with #150 Black Banded malleable-iron fittings and threaded joints.

B. Aboveground, distribution piping shall be the following:
1. Schedule 40 Black Steel pipe with #150 Black Banded malleable-iron fittings and threaded joints.

C. Piping Under buildings; NOT Permitted

B. Indicate extent of containment conduit on Drawings. Containment conduit is required for piping under buildings.

E. Galvanized steel pipe and fittings shall NOT be used.

3.13 UNDERGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

A. Connections to Existing Gas Piping: Use valve and fitting assemblies made for tapping utility's gas mains and listed by an NRTL.

B. Underground:
1. PE valves.
2. NPS 2 (DN 50) and Smaller: Bronze plug valves.
3. NPS 2-1/2 (DN 65) and Larger: Cast-iron, lubricated plug valves.

3.14 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

A. Valves for pipe sizes NPS 2 (DN 50) and smaller at service meter shall be the following:
1. Semi-steel Lubricated plug valve.

B. Valves for pipe sizes NPS 2-1/2 (DN 65) and larger at service meter shall be the following:
1. Semi-Steel flanged plug valve.

C. Distribution piping valves for pipe sizes NPS 2 (DN 50) and smaller shall be the following:
1. Semi-Steel lubricated plug valve.

D. Distribution piping valves for pipe sizes NPS 2-1/2 (DN 65) and larger shall be the following:
1. Semi-steel flanged, lubricated plug valve.

E. Valves in branch piping for single appliance shall be the following:
1. Bronze plug valve.

END OF SECTION

SECTION 22 13 16 – SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for soil, waste, vent and condensate piping inside the building:
   1. Pipe, tube, and fittings.
   2. Special pipe fittings.
   3. Encasement for underground metal piping.

B. Video taped sanitary waste piping

1.3 DEFINITIONS

A. PVC: Polyvinyl chloride plastic.

B. Flat Work: Concrete walks, concrete driveways, and asphalt paving.

1.4 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
   1. Soil, Waste, and Vent Piping: 5 P.S.I.

B. Seismic Performance: Soil, waste, and vent piping and support and installation shall be capable of withstanding the effects of seismic events determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures."

1.5 SUBMITTALS

A. Product Data: For pipe, tube, fittings, and couplings.

B. Field quality-control inspection and test reports.

1.6 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

C. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.3 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888-12 including Annex A1 from accredited ANSI inspection agency or CISPI 301-12 including Annex A1 from accredited ANSI inspection.
1. Heavy-Duty, Shielded, Stainless-Steel Couplings (Above Grade Use): With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.
a. Manufacturers:
1) ANACO.
2) Clamp-All Corp.
3) Ideal Div.; Stant Corp.
4) Mission Rubber Co.
5) Tyler Pipe; Soil Pipe Div.
2. Heavy-Duty, Shielded, Cast-Iron Couplings (Below Grade Use): ASTM A 48/A 48M, two-piece, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve.
a. Manufacturers:
1) MG Piping Products Co.

2.4 COPPER PIPE AND FITTINGS:

A. Hard Copper Tube: ASTM B 88, Types L tube, drawn temper.
1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings.

2.5 SPECIAL PIPE FITTINGS

A. Shielded Nonpressure Pipe Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
1. Manufacturers:
a. Cascade Waterworks Mfg. Co.
b. Mission Rubber Co.

B. Rigid, Unshielded, Nonpressure Pipe Couplings: ASTM C 1461, sleeve-type reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.
1. Manufacturers:
a. ANACO.

C. Wall-Penetration Fittings: Compound, ductile-iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
1. Manufacturers:
a. SIGMA Corp.

2.6 ENCASEMENT FOR UNDERGROUND METAL PIPING

A. Description: ASTM A 674 or AWWA C105, high-density, crosslaminated PE film of 0.004-inch minimum thickness.

B. Form: Sheet.

C. Color: Black.

D. Corrosion Control: Refer to Soil Corrosivity Study and Report for further requirements.

PART 3 - EXECUTION

3.1 EXCAVATION

D. Refer to Division 31 Section for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. Aboveground, soil and waste piping NPS 4 and smaller shall be the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, stainless-steel couplings; and hubless-coupling joints.
3. Steel pipe, drainage fittings, and threaded joints.

E. Aboveground, soil and waste piping NPS 5 and larger shall be the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, stainless-steel couplings; and hubless-coupling joints.

3. Steel pipe, drainage fittings, and threaded joints.

F. Aboveground, vent piping NPS 4 and smaller shall be the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, stainless-steel couplings; and hubless-coupling joints.
3. Steel pipe, drainage fittings, and threaded joints.

G. Aboveground, vent piping NPS 5 and larger shall be the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, stainless-steel couplings; and hubless-coupling joints.
3. Steel pipe, drainage fittings, and threaded joints.

H. Underground, soil, waste, and vent piping NPS 4 and smaller shall be the following:
1. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, cast-iron couplings; and hubless-coupling joints.

I. Underground, soil and waste piping NPS 5 and larger shall be the following:
1. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, cast-iron couplings; and hubless-coupling joints.

J. Condensate Piping: Type L hard drawn copper pipe with wrought copper solder fittings and couplings.

3.3 PIPING INSTALLATION

A. Sanitary sewer piping outside the building is specified in Division 33.

B. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."

C. nstall seismic restraints on piping. In accordance with Mason Seismic restraints guildelines.

D. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

E. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."

F. Install wall-penetration fitting at each service pipe penetration through foundation wall. Make installation watertight.

G. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.

H. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may

be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

I. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

J. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
   1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
   2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
   3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

K. Install engineered soil and waste drainage and vent piping systems as follows:
   1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.

L. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.

M. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

N. All interior condensate piping shall be insulated with closed cell foam insulation: with FHC 25/50 composite rating.

3.4 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."

B. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

C. All joints of buried hubless cast iron pipe and cast iron couplings shall be field wrapped.
   1. Prior to wrapping, fittings and field joints shall be washed with a non-oily solvent and then cleaned with a wire brush. After cleaning, fittings and field joints shall be coated and wrapped as follows:
      a. Coat of Koppers “Jet-Set” coal tap primer, applied uniformly to dry surfaces.
      b. Two layers of 2” wide 35 mils thick Polyken 931 black butyl rubber molding tape with 1” lap, covered with one layer of ¾” wide 15 mils thick Polyken 930 black polyethylene pressure sensitive tape with ¼” lap.
      c. Field wrapping shall extend 3 inches beyond joint.

3.5 HANGER AND SUPPORT INSTALLATION

A. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
   1. Vertical Piping: MSS Type 8 or Type 42, clamps.
   2. Install individual, straight, horizontal piping runs according to the following:
      a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
      b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
      c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.
   3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
   4. Base of Vertical Piping: MSS Type 52, spring hangers.

C. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

D. Support vertical piping at base and at each floor.

E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.

F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
   2. NPS 3: 60 inches with 1/2-inch rod.
   3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
   4. NPS 6: 60 inches with 3/4-inch rod.
   5. NPS 8 to NPS 12: 60 inches with 7/8-inch rod.

G. Install supports for vertical cast-iron soil piping every 15 feet.

H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/4: 84 inches with 3/8-inch rod.
   2. NPS 1-1/2: 108 inches with 3/8-inch rod.
   3. NPS 2: 10 feet with 3/8-inch rod.
   4. NPS 2-1/2: 11 feet with 1/2-inch rod.
   5. NPS 3: 12 feet with 1/2-inch rod.
   6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
   7. NPS 6: 12 feet with 3/4-inch rod.
   8. NPS 8 to NPS 12: 12 feet with 7/8-inch rod.

I. Install supports for vertical steel piping every 15 feet.

J. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

A. Interruption of Existing Sanitary Waste System: Do not interrupt Existing Sanitary Waste System to facilities occupied by Owner or others unless permitted under the following conditions:
   1. Notify Architect, Construction Manager, and Owner no fewer than seven (7) days in advance of proposed interruption.
   2. Do not proceed with interruption without Architect's Construction Manager's and Owner's written permission.

B. Drawings indicate general arrangement of piping, fittings, and specialties.

C. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

D. Connect drainage and vent piping to the following:
   1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
   2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
   3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.

E. Connect condensate to equipment with pipe sizes as indicated, but in no case shall the piping be smaller than the equipment condensate pipe size.

3.7 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
   1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
   2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
   1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
   2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
   3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in for not less than one hour. Close openings in piping system and fill with water to point of overflow, but not less than 5 P.S.I.; water level must not drop. Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.8 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.9 VIDEO TAPED SANITARY WASTE PIPING

A. Video taping shall include new and existing waste piping, and limited to the path of travel of the waste from the new construction to where the street main connection occurs.

B. All three (3) inch and larger piping shall be subjected to video taping.

C. The video taping shall occur after all testing of sanitary waste piping has been completed, and before flat work, such as concrete walks, and asphalt, has been installed.

D. Film: The taping shall be provided on high resolution color film that can be displayed on a common VHS recorder.

E. Record Drawings: The Contractor shall obtain a reproducible drawing from the Architect. The drawing shall provide accurate dimensioned record of routing of the system piping with invert elevations. Irregularities encountered such as obstructions in the pipe, broken pipe or piping that were installed differently from that shown on the drawings shall be identified, dimensioned and provided with invert elevations.
1. Encountered irregularities shall be reported to the plumbing Contractor for rectification. After encountered irregularities have been corrected the Architect shall have the right to request one additional visit from the contractor performing the video recording.
2. The video and the drawing are deemed to be complementary.
3. Before formal acceptance of the video tape and the drawing, both items shall be delivered to the On-Site Inspector for his review. The drawings will be signed by the Inspector before being delivered to the Architect.
4. If in the opinion of the Architect, the record drawing is not legible or the video and the drawing are not complementary the Video Taping Contractor shall employ a satisfactory draftsman to properly perform this work.

END OF SECTION

SECTION 22 13 19 – SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:
1. Cleanouts.
2. Floor Drains.
3. Floor Sink/Roof Receptor.
4. Miscellaneous sanitary drainage piping specialties.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for grease interceptors.

1.3 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 CLEANOUTS

B. Exposed Cast-Iron Cleanouts:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   b. Zurn Plumbing Products Group; Specification Drainage Operation.
   c. MIFAB, Inc.
2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
3. Size: Same as connected drainage piping
4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk, brass plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

C. Cast-Iron Floor Cleanouts:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   b. Zurn Plumbing Products Group; Specification Drainage Operation.
   c. MIFAB
2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Threaded, adjustable housing.

5. Body or Ferrule: Cast iron.
6. Clamping Device: Required.
7. Outlet Connection: Threaded.
8. Closure: Brass plug with tapered threads.
9. Adjustable Housing Material: Cast iron with threads.
10. Frame and Cover Material and Finish: Polished bronze.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Light Duty.
13. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

D. Cast-Iron Wall Cleanouts:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   b. Zurn Plumbing Products Group; Specification Drainage Operation.
   c. MIFAB, Inc.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk, drilled-and-threaded plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, chrome-plated brass or stainless-steel cover plate with screw.

1.2 2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains FD-1:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: (Refer to plans for model number)
   a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   b. Zurn Plumbing Products Group; Specification Drainage Operation.
   c. MIFAB, Inc.
2. Standard: ASME A112.6.3.
3. Pattern: Floor drain.
4. Body Material: Gray iron.
5. Seepage Flange: Required.
6. Anchor Flange: Required.
7. Clamping Device: Required.
8. Outlet: Bottom.
9. Top or Strainer Material: Nickel bronze.
10. Top of Body and Strainer Finish: Nickel bronze.
11. Top Shape: Round.
12. Top Loading Classification: Light Duty.
13. Inlet Fitting: Gray iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
14. Trap Material: Cast iron.
15. Trap Pattern: Standard P-trap.

2.3 FLOOR SINK / RECEPTOR

A. Cast-Iron Floor Sink /Roof Receptor RR-1:
1. Basis-of-Design Product: Subject to compliance with requirements, provide JR Smith No. 3960 or a comparable product by one of the following:

a. Commercial Enameling Co.
b. Josam Company; Josam Div.
c. MIFAB, Inc.
d. Zurn Plumbing Products Group; Specification Drainage Operation.

2. Standard: ASME A112.6.3.
3. Pattern: Floor / Roof Receptor.
4. Body Material: Cast iron.
5. Seepage Flange: Required.
6. Anchor Flange: Required.
7. Clamping Device: Required.
8. Outlet: Bottom.
9. Backwater Valve: Not required.
10. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant white enamel.
11. Sediment Bucket: Not required.
12. Grate and Rim Material: Stainless steel.
13. Top of Body and Strainer Finish: Stainless steel.
14. Top Shape: Round.
15. Dimensions of Top or Strainer: 7-1/2” diameter.
16. Top Loading Classification: Light Duty.
17. Funnel: Not required.
18. Inlet Fitting: Not Required.
19. Trap Material: Cast iron.
20. Trap Pattern: Deep seal P-trap.
21. Trap Features: Not required.

PART 3 - EXECUTION

3.1 INSTALLATION

B. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
4. Locate at base of each vertical soil and waste stack.

D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

F. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
1. Position floor drains for easy access and maintenance.
2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:

a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.

3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

G. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
2. Size: Same as floor drain inlet.

H. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.3 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

C. Corrosion Control: Refer to Soil Corrosivity Study and Report for further requirements.

END OF SECTION

SECTION 22 33 00 - ELECTRIC, DOMESTIC-WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Commercial, light-duty, storage, electric, domestic-water heaters.
2. Flow-control, electric, tankless, domestic-water heaters.
3. Domestic-water heater accessories.

1.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Commercial domestic-water heaters shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.4 ACTION SUBMITTALS

A. Product Data: For each type and size of domestic-water heater indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. CHPS Submittals:
1. Product Data for Prerequisite EA 2: Documentation indicating that units comply with applicable requirements in ASHRAE/IESNA 90.1, Section 7, "Service Water Heating."

C. Shop Drawings:
1. Wiring Diagrams: For power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For commercial domestic-water heaters, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Product Certificates: For each type of commercial and, electric, domestic-water heater, from manufacturer.

C. Domestic-Water Heater Labeling: Certified and labeled by testing agency acceptable to authorities having jurisdiction.

D. Source quality-control reports.

E. Field quality-control reports.

F. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For electric, domestic-water heaters to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, "Drinking Water System Components - Health Effects."

1.8 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including storage tank and supports.
      b. Faulty operation of controls.
      c. Deterioration of metals, metal finishes, and other materials beyond normal use.
   2. Warranty Periods: From date of Substantial Completion.
      a. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:
         1) Storage Tank: Five years.
         2) Controls and Other Components: Three years.
      b. Electric, Tankless, Domestic-Water Heaters: One year(s).
      c. Compression Tanks: Five years.

PART 2 - PRODUCTS

A. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters (EWH-1):

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bradford White Corporation or comparable product by one of the following:
   a. Smith, A. O. Water Products Co.; a division of A. O. Smith Corporation.
   b. Lochinvar Corporation.
   c. Rheem Manufacturing Company.
2. Standard: UL 174.
3. Storage-Tank Construction: Steel, vertical arrangement.
   a. Tappings: ASME B1.20.1 pipe thread.
   b. Pressure Rating: 150 psig.
   c. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending lining material into tappings.
4. Factory-Installed Storage-Tank Appurtenances:
   a. Anode Rod: Replaceable magnesium.
   b. Dip Tube: Required unless cold-water inlet is near bottom of tank.
   c. Drain Valve: ASSE 1005.
   d. Insulation: Comply with ASHRAE/IESNA 90.1 or ASHRAE 90.2.
   e. Jacket: Steel with enameled finish.
   f. Heat-Trap Fittings: Inlet type in cold-water inlet and outlet type in hot-water outlet.
   g. Heating Elements: Two; electric, screw-in immersion type; wired for simultaneous operation unless otherwise indicated. Limited to 12 kW total.
   h. Temperature Control: Adjustable thermostat.
   i. Safety Control: High-temperature-limit cutoff device or system.
   j. Relief Valve: ASME rated and stamped for combination temperature-and-pressure relief valves. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valve with sensing element that extends into storage tank.
5. Special Requirements: NSF 5 construction with legs for off-floor installation.

B. Capacity and Characteristics:
1. Capacity: Refer to equipment schedule on drawings.
2. Recovery: Refer to equipment schedule on drawings.
3. Temperature Setting: Refer to equipment schedule on drawings
4. Power Demand: Refer to equipment schedule on drawings
5. Heating Elements:
   a. Number of Elements: Two.
   b. Kilowatts Each Element: Refer to equipment schedule on drawings.
   c. Number of Stages: Two.
6. Electrical Characteristics:
   a. Volts: Refer to equipment schedule on drawings.
   b. Phases: Refer to equipment schedule on drawings.
   c. Hertz: 60.
   d. Full-Load Amperes: Refer to equipment schedule on drawings.
   e. Minimum Circuit Ampacity: Refer to equipment schedule on drawings.
   f. Maximum Overcurrent Protection: Refer to equipment schedule on drawings.

2.2 ELECTRIC WATER HEATER (EWH-2):

A. Thermostat-Control, Electric, Tankless, Domestic-Water Heaters:
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. Bosch Water Heating.
   b. Chronomite Laboratories, Inc.
   c. E-Tankless Water Heaters Corp.

d. Keltech, Inc.
e. Niagara Industries, Inc.

2. Standard: UL 499 for electric, tankless, (domestic-water heater) heating appliance.
3. Construction: Copper piping or tubing complying with NSF 61 barrier materials for potable water, without storage capacity.
   a. Connections: ASME B1.20.1 pipe thread.
   b. Pressure Rating: 150 psig.
   c. Heating Element: Resistance heating system.
   d. Temperature Control: Thermostat.
   e. Safety Control: High-temperature-limit cutoff device or system.
   f. Jacket: Aluminum or steel with enameled finish or plastic.
4. Support: Bracket for wall mounting.
5. Capacity and Characteristics:
   a. Flow Rate: Refer to equipment schedule on drawings .
   b. Temperature Setting: Refer to equipment schedule on drawings.
   c. Power Demand: Refer to equipment schedule on drawings.
   d. Electrical Characteristics:
      1) Volts: Refer to equipment schedule on drawings.
      2) Phases: Refer to equipment schedule on drawings.
      3) Hertz: 60.
      4) Full-Load Amperes: Refer to equipment schedule on drawings.
      5) Minimum Circuit Ampacity: Refer to equipment schedule on drawings.
      6) Maximum Overcurrent Protection: Refer to equipment schedule on drawings.

2.3 DOMESTIC WATER HEATER ACCESSORIES

A. Domestic Water Compression Tanks:
1. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
   a. Flexcon Industries.
   b. Smith, A. O. Water Products Co.; a division of A. O. Smith Corporation.
   c. Taco, Inc.
2. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
3. Construction:
   a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
   b. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
   c. Air-Charging Valve: Factory installed.
4. Capacity and Characteristics:
   a. Working-Pressure Rating: Refer to equipment schedule on drawings.
   b. Capacity Acceptable: Refer to equipment schedule on drawings.
   c. Air Precharge Pressure: Refer to equipment schedule on drawings.

B. Drain Pans: Corrosion-resistant metal with raised edge. Comply with ANSI/CSA LC 3. Include dimensions not less than base of domestic-water heater, and include drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.

C. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1 or ASHRAE 90.2.

D. Pressure Relief Valves: ASME rated and stamped. Include pressure setting less than domestic-water heater working-pressure rating.

E. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.

F. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.

G. Domestic-Water Heater Stands: Manufacturer's factory-fabricated steel stand for floor mounting, capable of supporting domestic-water heater and water. Include dimension that will support bottom of domestic-water heater a minimum of 18 inches above the floor.

H. Domestic-Water Heater Mounting Brackets: Manufacturer's factory-fabricated steel bracket for wall mounting, capable of supporting domestic-water heater and water.

2.4 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect domestic-water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.

B. Hydrostatically test commercial domestic-water heaters to minimum of one and one-half times pressure rating before shipment.

C. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 01 40 00 "Quality Requirements" for retesting and reinspecting requirements and Section 01 70 00 "Execution" for requirements for correcting the Work.

D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 WATER HEATER INSTALLATION

A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.
   1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand.
   2. Maintain manufacturer's recommended clearances.
   3. Arrange units so controls and devices that require servicing are accessible.
   4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
   5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
   6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   7. Install anchor bolts to elevations required for proper attachment to supported equipment.
   8. Anchor domestic-water heaters to substrate.

B. Electric, Tankless, Domestic-Water Heater Mounting: Install electric, tankless, domestic-water heaters at least 18 inches above floor] on wall bracket.

1. Maintain manufacturer's recommended clearances.
2. Arrange units so controls and devices that require servicing are accessible.
3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to supported equipment.
5. Anchor domestic-water heaters to substrate.

C. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
   1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Section 22 05 23 "General-Duty Valves for Plumbing Piping”.

D. Install commercial, electric, domestic-water heaters with seismic-restraint devices.

E. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

F. Install combination temperature-and-pressure relief valves in water piping for electric, domestic-water heaters without storage. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

G. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 22 11 19 "Domestic Water Piping Specialties."

H. Install thermometers on outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 22 05 19 "Meters and Gages for Plumbing Piping."

I. Install thermometers on inlet and outlet piping of residential, solar, electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 22 05 19 "Meters and Gages for Plumbing Piping."

J. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.

K. Fill electric, domestic-water heaters with water.

L. Charge domestic-water compression tanks with air.

3.2 CONNECTIONS

A. Comply with requirements for piping specified in Section 22 11 16 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.3 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.
1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 01 40 00 "Quality Requirements" for retesting and reinspecting requirements and Section 01 73 00 "Execution" for requirements for correcting the Work.

C. Prepare test and inspection reports.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain commercial, electric, domestic-water heaters.

END OF SECTION

SECTION 22 34 00 - FUEL-FIRED WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following fuel-fired water heaters:
   1. Commercial, storage, gas water heaters.
   2. Compression tanks.
   3. Water heater accessories.

1.3 DEFINITIONS

A. LP Gas: Liquefied-petroleum fuel gas.

1.4 SUBMITTALS

A. Product Data: For each type and size of water heater indicated. Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Product Certificates: For each type of commercial water heater, signed by product manufacturer.

D. Manufacturer Seismic Qualification Certification: Submit certification that commercial water heaters, accessories, and components will withstand seismic forces defined in Division 23 Section " Vibration and Seismic Controls for HVAC Piping and Equipment." Include the following:
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
      a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
      b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

E. Source quality-control test reports.

F. Field quality-control test reports.

G. Operation and Maintenance Data: For water heaters to include in emergency, operation, and maintenance manuals.

H. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain same type of water heaters through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of water heaters and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. ASME Compliance:
1. Where ASME-code construction is indicated, fabricate and label commercial water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
2. Where ASME-code construction is indicated, fabricate and label commercial, finned-tube water heaters to comply with ASME Boiler and Pressure Vessel Code: Section IV.

E. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9" for all components that will be in contact with potable water.

1.6 COORDINATION

A. Coordinate size and location of concrete bases with Architectural and Structural Drawings.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fuel-fired water heaters that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
   a. Structural failures including storage tank and supports.
   b. Faulty operation of controls.
   c. Deterioration of metals, metal finishes, and other materials beyond normal use.
2. Warranty Period(s): From date of Substantial Completion:
   a. Commercial, Gas Water Heaters:
      1) Storage Tank: Three years.
      2) Controls and Other Components: Three years.
   b. Compression Tanks: One year(s).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

B. Commercial, Storage, Gas Water Heaters: Comply with ANSI Z21.10.3/CSA 4.3.
   1. Manufacturers:
      a. Bradford White Corporation.
      b. Lochinvar Corporation.
      c. Smith, A. O. Water Products Company.
   2. Storage-Tank Construction: ASME-code steel with 150-psig working-pressure rating.
      a. Tappings: Factory fabricated of materials compatible with tank. Attach tappings to tank before testing.
         1) NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.
         2) NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.
      b. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
      c. Lining: Glass complying with NSF 61 barrier materials for potable-water tank linings, including extending lining into and through tank fittings and outlets.
   3. Factory-Installed, Storage-Tank Appurtenances:
      a. Anode Rod: Replaceable magnesium.
      b. Dip Tube: Provide unless cold-water inlet is near bottom of tank.
      c. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
      d. Insulation: Comply with ASHRAE/IESNA 90.1. Surround entire storage tank except connections and controls.
      e. Jacket: Steel with enameled finish.
      f. Burner: For use with power-vent water heaters and for natural-gas fuel.
      g. Automatic Ignition: ANSI Z21.20, electric, automatic, gas-ignition system.
      h. Temperature Control: Adjustable thermostat.
      i. Safety Controls: Automatic, high-temperature-limit and low-water cutoff devices or systems.
      j. Combination Temperature and Pressure Relief Valves: ANSI Z21.22/CSA 4.4. Include one or more relief valve with total relieving capacity at least as great as heat input, and include pressure setting less than water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.
   4. Special Requirements: NSF 5 construction.
   5. Power-Vent System: Exhaust fan, interlocked with burner.
   6. Energy Management System Interface: Normally closed dry contacts for enabling and disabling water heater.
   7. Capacity and Characteristics: (See schedule on drawings).

2.2 COMPRESSION TANKS

A. Description: Steel, pressure-rated tank constructed with welded joints and factory-installed, butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
   1. Manufacturers:
      a. AMTROL Inc.
      b. Armstrong Pumps, Inc.
      c. Smith, A. O.; Aqua-Air Div.
      d. Watts Regulator Co.
   2. Construction:
      a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
      b. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
      c. Air-Charging Valve: Factory installed.
   3. Capacity and Characteristics: (See schedule on drawings).

2.3 WATER HEATER ACCESSORIES

A. Gas Shutoff Valves: ANSI Z21.15/CGA 9.1, manually operated. Furnish for installation in piping.

B. Gas Pressure Regulators: ANSI Z21.18, appliance type. Include pressure rating, capacity, and pressure differential required between gas supply and water heater.

C. Gas Automatic Valves: ANSI Z21.21, appliance, electrically operated, on-off automatic valve.

D. Combination Temperature and Pressure Relief Valves: Include relieving capacity at least as great as heat input, and include pressure setting less than water heater working-pressure rating. Select each relief valve with sensing element that extends into storage tank.
   1. Gas Water Heaters: ANSI Z21.22/CSA 4.4.

E. Pressure Relief Valves: Include pressure setting less than working-pressure rating of water heater.
   1. Gas Water Heaters: ANSI Z21.22/CSA 4.4.

F. Water Heater Stand and Drain Pan Units: High-density-polyethylene-plastic, 18-inch- high, enclosed-base stand complying with IAPMO PS 103 and IAS No. 2. Include integral or separate drain pan with raised edge and NPS 1 drain outlet with ASME B1.20.1 pipe thread.

G. Drain Pans: Corrosion-resistant metal with raised edge. Provide dimensions not less than base of water heater and include drain outlet not less than NPS 3/4.

H. Piping Manifold Kits: Water heater manufacturer's factory-fabricated inlet and outlet piping arrangement for multiple-unit installation. Include piping and valves for field assembly that is capable of isolating each water heater and of providing balanced flow through each water heater.

I. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1 or ASHRAE 90.2.

2.4 SOURCE QUALITY CONTROL

A. Test and inspect water heater storage tanks, specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.

B. Hydrostatically test commercial water heater storage tanks before shipment to minimum of one and one-half times pressure rating.

C. Prepare test reports.

PART 3 - EXECUTION

3.1 WATER HEATER INSTALLATION

A. Install commercial water heaters as indicated on drawings.
1. Exception: Omit concrete bases for commercial water heaters if installation on stand, bracket, suspended platform, or direct on floor is indicated.
2. Concrete base construction requirements are specified in Division 22 Section "Common Work Results for Plumbing".

B. Install water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

C. Install seismic restraints for commercial water heaters. Anchor to substrate.

D. Install gas water heaters according to NFPA 54.

E. Install gas shutoff valves on gas supplies to gas water heaters without shutoff valves.

F. Install gas pressure regulators on gas supplies to gas water heaters without gas pressure regulators if gas pressure regulators are required to reduce gas pressure at burner.

G. Install automatic gas valves on gas supplies to gas water heaters, if required for operation of safety control.

H. Install combination temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater, relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

I. Install combination temperature and pressure relief valves in water piping for water heaters without storage. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

J. Install water heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for water

heaters that do not have tank drains. Refer to Division 22 Section "Plumbing Specialties" for hose-end drain valves.

K. Install thermometer on outlet piping of water heaters. Refer to Division 22 Section "Meters and Gages" for thermometers.

L. Install pressure gage(s) on inlet and outlet piping of commercial, fuel-fired water heater piping. Refer to Division 22 Section "Meters and Gages" for pressure gages.

M. Assemble and install inlet and outlet piping manifold kits for multiple water heaters. Fabricate, modify, or arrange manifolds for balanced water flow through each water heater. Include shutoff valve and thermometer in each water heater inlet and outlet, and throttling valve in each water heater outlet. Refer to Division 22 Section "Valves" for general-duty valves and to Division 22 Section "Meters and Gages" for thermometers.

N. Install piping-type heat traps on inlet and outlet piping of water heater storage tanks without integral or fitting-type heat traps.

O. Fill water heaters with water.

P. Charge compression tanks with air.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to water heaters to allow service and maintenance. Arrange piping for easy removal of water heaters.

C. Ground equipment according to Division 26 Section "Grounding and Bonding."

D. Connect wiring according to Division 26 Section "Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:
1. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, confirm proper operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace water heaters that do not pass tests and inspections and retest as specified above.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain commercial water heaters. Refer to Division 1 Section "Closeout Procedures."

END OF SECTION

SECTION 22 40 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Faucets for lavatories and sinks.
2. Flushometers.
3. Toilet seats.
4. Protective shielding guards.
5. Fixture supports.
6. Water closets.
7. Lavatories.
8. Sinks.

B. Related Sections include the following:
1. Division 22 Section "Drinking Fountains and Water Coolers."

1.2 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

C. FRP: Fiberglass-reinforced plastic.

D. PMMA: Polymethyl methacrylate (acrylic) plastic.

E. PVC: Polyvinyl chloride plastic.

F. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. B. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.

C. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

D. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

E. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
2. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
3. Solid-Surface-Material Lavatories and Sinks: ANSI/ICPA SS-1.
4. Vitreous-China Fixtures: ASME A112.19.2M.
5. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
6. Water-Closet, Flushometer Tank Trim: ASSE 1037.

F. Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:
1. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
2. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
3. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
4. Faucets: ASME A112.18.1.
5. Hose-Connection Vacuum Breakers: ASSE 1011.
6. Hose-Coupling Threads: ASME B1.20.7.
7. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
8. NSF Potable-Water Materials: NSF 61.
9. Pipe Threads: ASME B1.20.1.
10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
11. Supply Fittings: ASME A112.18.1.
12. Brass Waste Fittings: ASME A112.18.2.

G. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
1. Atmospheric Vacuum Breakers: ASSE 1001.
2. Brass and Copper Supplies: ASME A112.18.1.
3. Manual-Operation Flushometers: ASSE 1037.
4. Brass Waste Fittings: ASME A112.18.2.

H. Fixture controls shall comply with CBC section; 11B-608.5 for showers, 11B-606.4 for lavatories, 11B-604.6 for toilets and 11B-605.4 for Urinals.
1. Disposers: ASSE 1008 and UL 430.
2. Flexible Water Connectors: ASME A112.18.6.
3. Grab Bars: ASTM F 446.
4. Hose-Coupling Threads: ASME B1.20.7.
5. Off-Floor Fixture Supports: ASME A112.6.1M.
6. Pipe Threads: ASME B1.20.1.
7. Plastic Toilet Seats: ANSI Z124.5.
8. Supply and Drain Protective Shielding Guards: 2016 CBC.

PART 2 - PRODUCTS

2.1 SINK FAUCETS

I. Sink Faucets:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Chicago Faucets or a comparable product by on of the following: (Refer to plans for model number)
   a. Delta Faucet Company
   b. Just Manufacturing.
2. Description: Kitchen faucet with spray, three-hole fixture Service sink faucet with stops in shanks, vacuum breaker, hose-thread outlet, and pail hook. Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
   a. Body Material: Commercial, solid brass.
   b. Finish: Polished chrome plate.
   c. Maximum Flow Rate: 1.5 gpm, unless otherwise indicated.
   d. Mixing Valve: Two-lever handle.
   e. Centers: 4 inches.
   f. Mounting:
   g. Handle(s):
   h. Spout Type: Rigid, solid brass.
   i. Spout Outlet: Aerator.
   j. Drain: Grid offset tailpiece.

2.2 FLUSHOMETERS

A. Flushometers:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Sloan Valve Company or a comparable product by one of the following: (Refer to plans for model number)
   a. American Standard.
   b. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Flushometer for water-closet-type fixture. Include brass body with corrosion-resistant internal components, non-hold-open feature, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
   a. Internal Design: Diaphragm operation.
   b. Style: Exposed.
   c. Inlet Size: NPS 1.
   d. Trip Mechanism: Battery Operated, Sensor Activated.
   e. Consumption: 1.28 gal./flush.
3. Tailpiece Size: NPS 1 ½ and standard

2.3 TOILET SEATS

A. Toilet Seats:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

3. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings Beneke or a comparable product by one of the following: (Refer to plans for model number)
   a. Church Seats.
2. Description: Toilet seat for water-closet-type fixture.
   a. Material: Molded, solid plastic.
   b. Configuration: Open front without cover.
   c. Size: Elongated.
   d. Hinge Type: SS, self-sustaining.
   e. Class: Standard commercial.
   f. Color: White.

2.4 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Plumberex Specialty Products Inc.
   b. TRUEBRO, Inc.
2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ACC) requirements.

2.5 FIXTURE SUPPORTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Smith, Jay R. Mfg. Co.
2. MIFAB Manufacturing Inc.
3. Zurn Plumbing Products Group; Specification Drainage Operation.

C. Copy and edit paragraph and subparagraphs below for each type lavatory support required.

D. Lavatory Supports:
4. Description: Type II, lavatory carrier with concealed arms and tie rod for wall-mounting, lavatory-type fixture. Include steel uprights with feet.
5. Accessible-Fixture Support: Include rectangular steel uprights.

2.6 WATER CLOSETS

A. Water Closets, WC-1 (ACC) and WC-2 (ACC):
1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard vitreous china as indicate on drawings or a comparable product by one of the following: (Refer to plans for model number).
   a. Kohler Co.
   b. Or approved equal.
2. Description: Accessible, wall-mounted, back-outlet, designed for flushometer valve operation.

3. Style: Flushometer valve.
   a. Bowl Type: Elongated with siphon-jet design. Include bolt caps matching fixture.
   b. Height: Standard and Accessible (See Drawings).
   c. Design Consumption: 1.28 gal./flush.
   d. Color: White.

2.7 LAVATORIES

A. Lavatories, LV-1 (ACC) and LV-2 (ACC):
   1. Basis-of-Design: Subject to compliance with requirements provide American Standard “Lucerne” vitreous china or a comparable product by one of the following: (Refer to plans for model number)
      a. Kohler Co.
      b. Or approved equal.
   2. Description: Accessible Wall Type Lavatory: drilled for concealed arm assembly; furnished with wall mounted concealed lavatory arm assembly; strainer with 1¼” offset tailpiece, self closing faucet with vandal proof ½ gpm flow control, Chicago no. 1006 ½” loose key angle stop with ½” I.P.S. female inlet x 3/8” compression male outlet and brass wall escutcheon; Fluidmaster No-Burst B1F12 I.A.P.M.O. listed 3/8” x 12" braided stainless steel flexible risers with non-toxic polymer liner, 3/8” compression female inlet, ½” I.P.S. female outlet and hexagon non-ferrous nuts; 1¼” x 1½”cast brass L.A. “P” trap. Assembly shall comply with C.P.C. requirements for accessible fixtures.

1.2 2.8 SINKS

A. Sink, SK-1 (ACC) and SK-2 (ACC):
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Just Manufacturing Company or a comparable product by one of the following: (Refer to plans for model number).
      a. Elkay Manufacturing Co
      b. Just Manufacturing Co.
   2. Description: 18 gauge, Type 304 stainless steel with stainless steel strainer with 1½” tailpieces; faucet vandal proof ½ gpm laminar flow control head, Chicago no. 1006 ½” loose key angle stop with ½” I.P.S. female inlet x 3/8” compression male outlet and brass wall escutcheon, Fluidmaster No-Burst B1F12 I.A.P.M.O. listed 3/8” x 12" braided stainless steel flexible risers with non-toxic polymer liner, 3/8” compression female inlet, ½” I.P.S. female outlet and hexagon non-ferrous nuts, continuous brass drain and 1½” cast brass L.A. “P” trap. Assembly shall comply with C.P.C requirements for accessible fixtures.

PART 3 - EXECUTION

3.1 INSTALLATION

B. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.

C. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.

1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.

D. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.

E. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.

F. Install wall-mounting fixtures with tubular waste piping attached to supports.

G. Install fixtures level and plumb according to roughing-in drawings.

H. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.

I. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.

J. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.

K. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.

L. Install toilet seats on water closets.

M. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

N. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.

O. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

P. Install traps on fixture outlets.
1. Exception: Omit trap on fixtures with integral traps.
2. Exception: Omit trap on indirect wastes, unless otherwise indicated.

Q. Install escutcheons at piping wall and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Escutcheons are specified in Division 22 Section "Common Work Results for Plumbing."

R. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.

B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.4 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION

SECTION 22 47 00 - DRINKING FOUNTAINS AND WATER COOLERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Wall-mounting drinking fountains and bottle filling station.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for fixtures for people with disabilities.

B. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

PART 2 - PART 2 - PRODUCTS

2.1 2.1 DRINKING FOUNTAINS

A. Drinking Fountains, DF-1:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Elkay Manufacturing or a comparable product by one of the following: (Refer to plans for model number)
      a. Haws Corporation.
      b. Murdock Fountains.
   2. Description: Wall-mounted drinking fountain.
      a. Material: Barrier-free drinking fountain with soft rounded corners and polished gloss white finish complying with ASME 112.19.2M.
      b. Receptor Shape: Round.
      c. Back Panel: Stainless-steel wall plate behind drinking fountain.
      d. Bubblers: One, with adjustable stream regulator, located on deck.
      e. Control: Push button ADA compliant.
      f. Supply: NPS 3/8 with ball, gate, or globe valve.
      g. Drain: Grid with NPS 1-1/4 minimum horizontal waste and trap complying with ASME A112.18.2.

PART 3 - EXECUTION

3.1 APPLICATIONS

B. Use carrier off-floor supports for wall-mounting fixtures, unless otherwise indicated.

C. Set freestanding and pedestal drinking fountains on floor.

D. Use chrome-plated brass or copper tube, fittings, and valves in locations exposed to view.

3.2 INSTALLATION

A. Install off-floor supports affixed to building substrate and attach wall-mounting fixtures, unless otherwise indicated.

B. Install fixtures level and plumb. For fixtures indicated for children, install at height required by authorities having jurisdiction.

C. Install water-supply piping with shutoff valve on supply to each fixture to be connected to water distribution piping. Use ball, gate, or globe valve. Install valves in locations where they can be easily reached for operation. Valves are specified in Division 22 Section "General-Duty Valves for Plumbing Piping."

D. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.

E. Install pipe escutcheons at wall penetrations in exposed, finished locations. Use deep-pattern escutcheons where required to conceal protruding pipe fittings. Escutcheons are specified in Division 22 Section "Common Work Results for Plumbing."

F. Seal joints between fixtures and walls and floors using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."

3.3 CONNECTIONS

A. Connect fixtures with water supplies, traps, and risers, and with soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Water Cooler Testing: After electrical circuitry has been energized, test for compliance with requirements. Test and adjust controls and safeties.
   1. Remove and replace malfunctioning units and retest as specified above.
   2. Report test results in writing.

3.5 ADJUSTING

A. Adjust fixture flow regulators for proper flow and stream height.

B. Adjust water cooler temperature settings.

END OF SECTION

SECTION 23 05 00 – COMMON WORK RESULTS FOR HVAC

PART 1 - PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Piping materials and installation instructions common to most piping systems.
   2. Equipment installation requirements common to equipment sections.
   3. Concrete bases.
   4. Supports and anchorages.

1.2 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

A. Welding certificates.

1.4 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
   1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
   2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately

modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

F. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

G. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.

C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.

F. Welding Filler Metals: Comply with AWS D10.12.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

G. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

H. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

I. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

J. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

K. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

L. Install piping to permit valve servicing.

M. Install piping at indicated slopes.

N. Install piping free of sags and bends.

O. Install fittings for changes in direction and branch connections.

P. Install piping to allow application of insulation.

Q. Select system components with pressure rating equal to or greater than system operating pressure.

R. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

S. Verify final equipment locations for roughing-in.

T. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.2 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.3 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.4 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.5 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to supported equipment.
6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 05 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

C. Field Welding: Comply with AWS D1.1.

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

END OF SECTION

SECTION 23 05 13 – COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.2 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
   1. Motor controllers.
   2. Torque, speed, and horsepower requirements of the load.
   3. Ratings and characteristics of supply circuit and required control sequence.
   4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.

B. Comply with NEMA MG 1 unless otherwise indicated.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.

B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

B. Efficiency: Energy efficient, as defined in NEMA MG 1.

C. Service Factor: 1.15.

D. Multispeed Motors: Variable torque.
   1. For motors with 2:1 speed ratio, consequent pole, single winding.

2. For motors with other than 2:1 speed ratio, separate winding for each speed.

E. Rotor: Random-wound, squirrel cage.

F. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

G. Temperature Rise: Match insulation rating.

H. Insulation: Class F.

I. Code Letter Designation:
1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.

J. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

2.5 SINGLE-PHASE MOTORS

A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
1. Permanent-split capacitor.
2. Split phase.
3. Capacitor start, inductor run.
4. Capacitor start, capacitor run.

B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

D. Motors 1/20 HP and Smaller: Shaded-pole type.

E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 23 05 29 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Steel pipe hangers and supports.
   2. Trapeze pipe hangers.
   3. Metal framing systems.
   4. Fastener systems.
   5. Equipment supports.

B. See Division 05 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

C. See Division 21 Section "Water-Based Fire-Suppression Systems" for pipe hangers for fire-protection piping.

D. See Division 23 Section(s) "Metal Ducts" for duct hangers and supports.

1.2 DEFINITIONS

A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.4 SUBMITTALS

A. Product Data: For the following:
   1. Steel pipe hangers and supports.
   2. Powder-actuated fastener systems.

B. Welding certificates

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

B. Manufacturers:
   1. AAA Technology & Specialties Co., Inc.
   2. Bergen-Power Pipe Supports.
   3. B-Line Systems, Inc.; a division of Cooper Industries.
   4. Carpenter & Paterson, Inc.
   5. Empire Industries, Inc.
   6. ERICO/Michigan Hanger Co.
   7. Globe Pipe Hanger Products, Inc.
   8. Grinnell Corp.
   9. GS Metals Corp.
   10. National Pipe Hanger Corporation.
   11. PHD Manufacturing, Inc.
   12. PHS Industries, Inc.
   13. Piping Technology & Products, Inc.
   14. Tolco Inc.

C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

B. Manufacturers:
1. B-Line Systems, Inc.; a division of Cooper Industries.
2. ERICO/Michigan Hanger Co.; ERISTRUT Div.
3. GS Metals Corp.
4. Power-Strut Div.; Tyco International, Ltd.
5. Thomas & Betts Corporation.
6. Tolco Inc.
7. Unistrut Corp.; Tyco International, Ltd.

C. Coatings: Pregalvanized or hot dipped for outdoors. Manufacturers standard finish indoors.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.5 FASTENER SYSTEMS

A. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
a. B-Line Systems, Inc.; a division of Cooper Industries.
b. Empire Industries, Inc.
c. Hilti, Inc.
d. ITW Ramset/Red Head.
e. MKT Fastening, LLC.
f. Powers Fasteners.

2.6 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.7 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

1. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
2. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
3. Use padded hangers for piping that is subject to scratching.
4. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   a. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
   b. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F pipes, NPS 4 to NPS 16, requiring up to 4 inches of insulation.
   c. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24, requiring clamp flexibility and up to 4 inches of insulation.
   d. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
   e. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.
   f. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange.
   g. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30, from 2 rods if longitudinal movement caused by expansion and contraction might occur.
   h. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42, if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
5. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   a. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
   b. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.
6. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   a. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
   b. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
7. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   a. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   b. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
   c. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   d. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   e. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   f. C-Clamps (MSS Type 23): For structural shapes.
   g. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      1) Light (MSS Type 31): 750 lb
      2) Medium (MSS Type 32): 1500 lb

3) Heavy (MSS Type 33): 3000 lb

h. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

i. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

8. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   a. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
   b. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
   c. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
9. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   a. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
   b. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
   c. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.
10. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
11. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
12. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
   1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
   2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.

D. Fastener System Installation:
   1. Install powder-actuated fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
   2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

J. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

L. Insulated Piping: Comply with the following:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      c. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.
   2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
   3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
   4. Shield Dimensions for Pipe: Not less than the following:
      a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
      b. NPS 4: 12 inches long and 0.06 inch thick.
      c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
      d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
      e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
   5. Pipes NPS 8 and Larger: Include wood inserts.
   6. Insert Material: Length at least as long as protective shield.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.5 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION **23 05 48** – VIBRATION AND SEISMIC CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Elastomeric isolation pads.
2. Restraint cables.
3. Seismic-restraint accessories.

1.3 DEFINITIONS

A. IBC: International Building Code.

B. ICC-ES: ICC-Evaluation Service.

C. OSHPD: Office of Statewide Health Planning & Development (for the State of California).

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device and seismic-restraint component required.
a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by OSHPD.
b. Annotate to indicate application of each product submitted and compliance with requirements.

B. Shop Drawings:
1. Detail fabrication and assembly of equipment bases. Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal: For each vibration isolation and seismic-restraint device.
1. Include design calculations and details for selecting vibration isolators, seismic restraints, and vibration isolation bases complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Design Calculations: Calculate static and dynamic loading due to equipment weight, operation, and seismic forces required to select vibration isolators and seismic restraints and for designing vibration isolation bases.

a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show coordination of vibration isolation device installation and seismic bracing for HVAC piping and equipment with other systems and equipment in the vicinity, including other supports and restraints, if any.

B. Qualification Data: For professional engineer.

C. Welding certificates.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1 ELASTOMERIC ISOLATION PADS

A. Elastomeric Isolation Pads: .
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings:
2. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.
3. Size: Factory or field cut to match requirements of supported equipment.
4. Pad Material: Oil and water resistant with elastomeric properties.
5. Surface Pattern: Ribbed pattern.

2.2 SPRING HANGERS

A. Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. California Dynamics Corporation.
b. Mason Industries, Inc.
c. Vibration Isolation.
2. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
7. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
8. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
9. Self-centering hanger-rod cap to ensure concentricity between hanger rod and support spring coil.

2.3 RESTRAINT CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Kinetics Noise Control, Inc.
2. Loos & Co., Inc.
3. Vibration Mountings & Controls, Inc.

B. Restraint Cables: ASTM A 603 galvanized-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.4 SEISMIC-RESTRAINT ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper B-Line, Inc.
2. Kinetics Noise Control, Inc.
3. Mason Industries, Inc.
4. TOLCO.

B. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

C. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

D. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices used.

E. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic- and wind-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by OSHPD.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.3 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 03 30 00 "Cast-in-Place Concrete."

B. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.

C. Comply with requirements in Section 07 72 00 "Roof Accessories" for installation of roof curbs, equipment supports, and roof penetrations.

D. Equipment Restraints:
1. Install seismic snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.

3. Install seismic-restraint devices using methods approved by OSHPD that provides required submittals for component.

E. Piping Restraints:
1. Comply with requirements in MSS SP-127.
2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
3. Brace a change of direction longer than 12 feet.

F. Install cables so they do not bend across edges of adjacent equipment or building structure.

G. Install seismic-restraint devices using methods approved by OSHPD that provides required submittals for component.

H. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

I. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

J. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

K. Drilled-in Anchors:
1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 23 21 13 "Hydronic Piping" for piping flexible connections.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:
1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. Measure isolator restraint clearance.
7. Measure isolator deflection.
8. Verify snubber minimum clearances.
9. Test and adjust restrained-air-spring isolator controls and safeties.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.6 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

END OF SECTION

SECTION 23 05 53 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Duct labels.

1.2 SUBMITTAL

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: Black.
3. Background Color: White.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: Yellow or Orange.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

2.4 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: White.

C. Background Color: Blue.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
   1. Near each valve and control device.
   2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
   7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

B. Pipe Label Color Schedule:
   1. Refrigerant Piping:
      a. Background Color: Yellow.
      b. Letter Color: Black.

3.4 DUCT LABEL INSTALLATION

A. Install plastic-laminated duct labels with permanent adhesive on air ducts in the following color codes:
   1. Blue: For cold-air supply ducts.
   2. Yellow: For hot-air supply ducts.
   3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
   4. ASME A13.1 Colors and Designs: For hazardous material exhaust.

B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

END OF SECTION

SECTION 23 05 93 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes TAB to produce design objectives for the following:
   1. Air Systems:
      a. Constant-volume air systems.
   2. HVAC equipment quantitative-performance settings.
   3. Verifying that automatic control devices are functioning properly.
   4. Reporting results of activities and procedures specified in this Section.

1.2 SUBMITTALS

A. Certified TAB Reports: Submit two copies of reports prepared, as specified in this Section, on approved forms certified by TAB firm.

B. Warranties specified in this Section.

1.3 QUALITY ASSURANCE

A. TAB Firm Qualifications: Engage a TAB firm certified by AABC.

B. Certification of TAB Reports: Certify TAB field data reports. This certification includes the following:
   1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
   2. Certify that TAB team complied with approved TAB plan and the procedures specified and referenced in this Specification.

C. TAB Report Forms: Use standard forms from AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems."

1.4 COORDINATION

A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist TAB activities.

B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.5 WARRANTY

A. National Project Performance Guarantee: Provide a guarantee on AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems" forms stating that AABC will assist in completing requirements of the Contract Documents if TAB firm fails to comply with the Contract Documents. Guarantee includes the following provisions:

PART 2 - PRODUCTS

2.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
   1. Verify that balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of HVAC systems and equipment.

C. Examine Project Record Documents described in Division 01 Section "Project Record Documents."

D. Examine design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data including fan and pump curves. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Sections have been performed.

G. Examine system and equipment test reports.

H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and that their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

J. Examine HVAC equipment to ensure that clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

K. Examine plenum ceilings used for supply air to verify that they are airtight. Verify that pipe penetrations and other holes are sealed.

L. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

M. Examine equipment for installation and for properly operating safety interlocks and controls.

N. Examine automatic temperature system components to verify the following:
1. Dampers, valves, and other controlled devices are operated by the intended controller.
2. Dampers and valves are in the position indicated by the controller.
3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multizone units, mixing boxes, and variable-air-volume terminals.
4. Automatic modulating and shutoff valves, including two-way valves and three-way mixing and diverting valves, are properly connected.
5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
6. Sensors are located to sense only the intended conditions.
7. Sequence of operation for control modes is according to the Contract Documents.
8. Controller set points are set at indicated values.
9. Interlocked systems are operating.
10. Changeover from heating to cooling mode occurs according to indicated values.

O. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Complete system readiness checks and prepare system readiness reports. Verify the following:
1. Permanent electrical power wiring is complete.
2. Automatic temperature-control systems are operational.
3. Equipment and duct access doors are securely closed.
4. Balance, smoke, and fire dampers are open.
5. Isolating and balancing valves are open and control valves are operational.
6. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
7. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems" and this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to insulation Specifications for this Project.

C. Mark equipment and balancing device settings with paint or other suitable, permanent identification material, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Determine the best locations in main and branch ducts for accurate duct airflow measurements.

D. Check airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Verify that motor starters are equipped with properly sized thermal protection.

G. Check dampers for proper position to achieve desired airflow path.

H. Check for airflow blockages.

I. Check condensate drains for proper connections and functioning.

J. Check for proper sealing of air-handling unit components.

K. Check for proper sealing of air duct system.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
   1. Measure fan static pressures to determine actual static pressure as follows:
      a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.
      b. Measure static pressure directly at the fan outlet or through the flexible connection.
      c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
      d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
   2. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
      a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.
   3. Measure static pressures entering and leaving other devices such as sound traps, heat recovery equipment, and air washers, under final balanced conditions.

4. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.
5. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.
6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur.
7. Measure amperage in full cooling, full heating, economizer, and any other operating modes to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.
1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.
a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
2. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

3.6 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
1. Manufacturer, model, and serial numbers.
2. Motor horsepower rating.
3. Motor rpm.
4. Efficiency rating.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter thermal-protection-element rating.

3.7 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.

B. Measure entering- and leaving-air temperatures.

C. Record compressor data.

3.8 PROCEDURES FOR HEAT-TRANSFER COILS

A. Refrigerant Coils: Measure the following data for each coil:
1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.
5. Refrigerant suction pressure and temperature.

3.9 PROCEDURES FOR TEMPERATURE MEASUREMENTS

A. During TAB, report the need for adjustment in temperature regulation within the automatic temperature-control system.

B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of two successive eight-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.

C. Measure outside-air, wet- and dry-bulb temperatures.

3.10 TEMPERATURE-CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between set points and actual measurements.

D. Check the operation of limiting controllers (i.e., high- and low-temperature controllers).

E. Check free travel and proper operation of control devices such as damper and valve operators.

F. Check the sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water flow measurements. Note the speed of response to input changes.

G. Check the interaction of electrically operated switch transducers.

H. Check the interaction of interlock and lockout systems.

I. Check main control supply-air pressure and observe compressor and dryer operations.

J. Record voltages of power supply and controller output. Determine whether the system operates on a grounded or nongrounded power supply.

K. Note operation of electric actuators using spring return for proper fail-safe operations.

3.11 TOLERANCES

A. Set HVAC system airflow and water flow rates within the following tolerances:
   1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 5 to plus 10 percent.
   2. Air Outlets and Inlets: 0 to minus 10 percent.

3.12 FINAL REPORT

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in three-ring binder, tabulated and divided into sections by tested and balanced systems.

B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.
   1. Include a list of instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to certified field report data, include the following:
   1. Fan curves.
   2. Manufacturers' test data.
   3. Field test reports prepared by system and equipment installers.
   4. Other information relative to equipment performance, but do not include Shop Drawings and Product Data.

D. General Report Data: In addition to form titles and entries, include the following data in the final report, as applicable:
   1. Title page.
   2. Name and address of TAB firm.
   3. Project name.
   4. Project location.
   5. Architect's name and address.
   6. Engineer's name and address.
   7. Contractor's name and address.
   8. Report date.
   9. Signature of TAB firm who certifies the report.
   10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
   11. Summary of contents including the following:
      a. Indicated versus final performance.
      b. Notable characteristics of systems.
      c. Description of system operation sequence if it varies from the Contract Documents.
   12. Nomenclature sheets for each item of equipment.
   13. Notes to explain why certain final data in the body of reports varies from indicated values.
   14. Test conditions for fans and pump performance forms including the following:
      a. Settings for outside-, return-, and exhaust-air dampers.
      b. Conditions of filters.
      c. Cooling coil, wet- and dry-bulb conditions.
      d. Face and bypass damper settings at coils.
      e. Fan drive settings including settings and percentage of maximum pitch diameter.
      f. Settings for supply-air, static-pressure controller.
      g. Other system operating conditions that affect performance.

E. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
   1. Quantities of outside, supply, return, and exhaust airflows.
   2. Duct, outlet, and inlet sizes.
   3. Balancing stations.
   4. Position of balancing devices.

3.13 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional testing, inspecting, and adjusting during near-peak summer and winter conditions.

END OF SECTION

SECTION 23 07 00 – HVAC INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Insulation Materials:
   a. Flexible elastomeric
   b. Mineral fiber
2. Fire-rated insulation systems
3. Insulating cements
4. Adhesives
5. Mastics
6. Sealants
7. Factory-applied jackets
8. Field-applied fabric-reinforcing mesh
9. Field-applied jackets
10. Tapes
11. Securements
12. Corner angles

B. Related Sections:
1. Division 22 Section "Plumbing Insulation.”
2. Division 23 Section "Metal Ducts" for duct liners.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at pipe expansion joints for each type of insulation.
3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
4. Detail removable insulation at piping specialties, equipment connections, and access panels.
5. Detail application of field-applied jackets.
6. Detail application at linkages of control devices.
7. Detail field application for each equipment type.

C. Field quality-control reports.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and

cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

D. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Aeroflex USA Inc.; Aerocel
   b. Armacell LLC; AP Armaflex
   c. RBX Corporation; Insul-Sheet 1800 and Insul-Tube 180

E. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. CertainTeed Corp.; Duct Wrap
   b. Johns Manville; Microlite
   c. Knauf Insulation; Duct Wrap
   d. Owens Corning; All-Service Duct Wrap

2.2 INSULATING CEMENTS

A. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Insulco, Division of MFS, Inc.; SmoothKote
   b. P. K. Insulation Mfg. Co., Inc.; PK No. 127, and Quik-Cote
   c. Rock Wool Manufacturing Company; Delta One Shot

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Aeroflex USA Inc.; Aeroseal
b. Armacell LCC; 520 Adhesive
c. Foster Products Corporation, H. B. Fuller Company; 85-75
d. RBX Corporation; Rubatex Contact Adhesive

C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
1. 1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-82
b. Foster Products Corporation, H. B. Fuller Company; 85-20
c. ITW TACC, Division of Illinois Tool Works; S-90/80
d. Marathon Industries, Inc.; 225
e. Mon-Eco Industries, Inc.; 22-25

D. PVC Jacket Adhesive: Compatible with PVC jacket.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Chemical Company (The); 739, Dow Silicone
b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive
c. P.I.C. Plastics, Inc.; Welding Adhesive
d. Red Devil, Inc.; Celulon Ultra Clear
e. Speedline Corporation; Speedline Vinyl Adhesive

2.4 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-35
a. b. Foster Products Corporation, H. B. Fuller Company; 30-90
b. c. ITW TACC, Division of Illinois Tool Works; CB-50
d. Marathon Industries, Inc.; 590
e. Mon-Eco Industries, Inc.; 55-40
f. Vimasco Corporation; 749
2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight
5. Color: White

2.5 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-76-8

b. Foster Products Corporation, H. B. Fuller Company; 95-44
c. Marathon Industries, Inc.; 405
d. Mon-Eco Industries, Inc.; 44-05
e. Vimasco Corporation; 750

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.

2.6 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.7 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. inch, in a Leno weave, for duct, equipment, and pipe.
1. Products: Subject to compliance with requirements, provide one of the following:
c. a. Foster Products Corporation, H. B. Fuller Company; Mast-A-Fab
d. b. Vimasco Corporation; Elastafab 894

2.8 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Johns Manville; Zeston
b. P.I.C. Plastics, Inc.; FG Series
c. Proto PVC Corporation; LoSmoke
d. Speedline Corporation; SmokeSafe
2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

C. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105 or 5005, Temper H-14.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Products, Division of ITW; Metal Jacketing Systems.
      b. PABCO Metals Corporation; Surefit.
      c. RPR Products, Inc.; Insul-Mate.
   2. Finish and thickness are indicated in field-applied jacket schedules.
   3. Moisture Barrier for Indoor Applications: 1-mil- thick, heat-bonded polyethylene and kraft paper.
   4. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
   5. Factory-Fabricated Fitting Covers:
      a. Same material, finish, and thickness as jacket
      b. Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows
      c. Tee covers
      d. Flange and union covers
      e. End caps
      f. Beveled collars
      g. Valve covers
      h. Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

2.9 TAPES

A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827
      b. Compac Corp.; 110 and 111
      c. Ideal Tape Co., Inc., an American Biltrite Company; 491 AWF FSK
      d. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ
   2. Width: 3 inches
   3. Thickness: 6.5 mils
   4. Adhesion: 90 ounces force/inch in width
   5. Elongation: 2 percent
   6. Tensile Strength: 40 lbf/inch in width
   7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape

2.10 SECUREMENTS

A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing or closed seal.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Products; Bands.
      b. PABCO Metals Corporation; Bands.
      c. RPR Products, Inc.; Bands.

D. Insulation Pins and Hangers:
   1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Products: Subject to compliance with requirements, provide one of the following:
1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series T.
2) GEMCO; Perforated Base.
3) Midwest Fasteners, Inc.; Spindle.
b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
c. Spindle: Copper- or zinc-coated, low carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
a. Products: Subject to compliance with requirements, provide one of the following:
1) AGM Industries, Inc.; RC-150.
4) GEMCO; R-150.
5) Midwest Fasteners, Inc.; WA-150.
6) Nelson Stud Welding; Speed Clips.
b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

E. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

F. Wire: 0.080-inch nickel-copper alloy.
1. Manufacturers: Subject to compliance with requirements:
a. C & F Wire
b. Childers Products
c. PABCO Metals Corporation
d. RPR Products, Inc

2.11 CORNER ANGLES

A. PVC Corner Angles: 30 mils thick, minimum 1 by 1 inch, PVC according to ASTM D 1784, Class 16354-C. White or color-coded to match adjacent surface.

G. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105 or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

H. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

I. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

J. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

K. Install insulation with longitudinal seams at top and bottom of horizontal runs.

L. Install multiple layers of insulation with longitudinal and end seams staggered.

M. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

N. Keep insulation materials dry during application and finishing.

O. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

P. Install insulation with least number of joints practical.

Q. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

R. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

S. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
   a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.

T. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

U. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

V. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

W. For above ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.3 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

X. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

Y. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

Z. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

AA. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
1. Comply with requirements in Division 07 Section "Penetration Firestopping" and fire-resistive joint sealers.

BB. Insulation Installation at Floor Penetrations:
1. Duct: Install insulation continuously through floor penetrations that are not fire rated. For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Pipe: Install insulation continuously through floor penetrations. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping.

3.4 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

CC. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic

for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

DD. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

EE. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.5 FLEXIBLE ELASTOMERIC INSULATION INSTALLATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

FF. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

GG. Insulation Installation on Pipe Fittings and Elbows:
1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

HH. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 MINERAL-FIBER INSULATION INSTALLATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
   a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
   b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
   c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
   d. Do not overcompress insulation during installation.
   e. Impale insulation over pins and attach speed washers.
   f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
   a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
   b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the

surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.7 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:
   1. Draw jacket material smooth and tight.
   2. Install lap or joint strips with same material as jacket.
   3. Secure jacket to insulation with manufacturer's recommended adhesive.
   4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
   5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

II. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.
   1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

JJ. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

KK. Where PVDC jackets are indicated, install as follows:
   1. Apply three separate wraps of filament tape per insulation section to secure pipe insulation to pipe prior to installation of PVDC jacket.
   2. Wrap factory-presized jackets around individual pipe insulation sections with one end overlapping the previously installed sheet. Install presized jacket with an approximate overlap at butt joint of 2 inches over the previous section. Adhere lap seal using adhesive or SSL, and then apply 1-1/4 circumferences of appropriate PVDC tape around overlapped butt joint.
   3. Continuous jacket can be spiral wrapped around a length of pipe insulation. Apply adhesive or PVDC tape at overlapped spiral edge. When electing to use adhesives, refer to manufacturer's written instructions for application of adhesives along this spiral edge to maintain a permanent bond.
   4. Jacket can be wrapped in cigarette fashion along length of roll for insulation systems with an outer circumference of 33-1/2 inches or less. The 33-1/2-inch- circumference limit allows for 2-inch- overlap seal. Using the length of roll allows for longer sections of jacket to be installed at one time. Use adhesive on the lap seal. Visually inspect lap seal for "fishmouthing," and use PVDC tape along lap seal to secure joint.
   5. Repair holes or tears in PVDC jacket by placing PVDC tape over the hole or tear and wrapping a minimum of 1-1/4 circumferences to avoid damage to tape edges.

3.8 FINISHES

A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

3.9 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:
1. Indoor, concealed supply, return, and outdoor air.

LL. Items Not Insulated:
1. Fibrous-glass ducts
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts
4. Factory-insulated plenums and casings
5. Flexible connectors
6. Vibration-control devices
7. Factory-insulated access panels and doors

3.10 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed, Supply, Return, and Outdoor Air Duct and Plenum Insulation: Mineral-fiber blanket 3 inches thick and 1.5-lb/cu. ft. nominal density with installed R value of 8.0.

3.11 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

MM. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
1. Drainage piping located in crawl spaces
2. Underground piping
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.12 INDOOR PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping: Flexible elastomeric, 1 inch thick.

3.13 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping: Insulation shall be the following:
1. Flexible Elastomeric: 2 inches thick

3.14 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Piping, Concealed:
1. None

NN. Piping, Exposed:
1. 1. PVC: 20 mils thick

3.15 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Piping:
1. Aluminum, Stucco Embossed: 0.024 inch thick
2.
3.

END OF SECTION

SECTION 23 23 00 – REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

1.2 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-410A:
   1. Suction Lines for Air-Conditioning Applications: 185 psig.
   2. Suction Lines for Heat-Pump Applications: 325 psig.
   3. Hot-Gas and Liquid Lines: 325 psig.

1.3 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop based on manufacturer's test data.

B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.
   1. Refrigerant piping indicated on Drawings is schematic only. Size piping and design actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.

C. Field quality-control test reports.

D. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.5 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

B. Copper Tube: ASTM B280, Type ACR.

C. Wrought-Copper Fittings: ASME B16.22.

D. Wrought-Copper Unions: ASME B16.22.

E. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

F. Brazing Filler Metals: AWS A5.8.

G. Flexible Connectors:
1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
2. End Connections: Socket ends.
3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
4. Pressure Rating: Factory test at minimum 500 psig.
5. Maximum Operating Temperature: 250 deg F.

2.2 VALVES AND SPECIALTIES

A. Service Valves:
1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Copper spring.
5. Working Pressure Rating: 500 psig.

B. Thermostatic Expansion Valves: Comply with ARI 750.
1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Suction Temperature: 40 deg F.
6. Superheat: Adjustable.
7. Reverse-flow option (for heat-pump applications).
8. End Connections: Socket, flare, or threaded union.
9. Working Pressure Rating: 700 psig.

C. Moisture/Liquid Indicators:
1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig.

7. Maximum Operating Temperature: 240 deg F.

D. Permanent Filter Dryers: Comply with ARI 730.
1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Designed for reverse flow (for heat-pump applications).
4. End Connections: Socket.
5. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg F.

2.3 REFRIGERANTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Atofina Chemicals, Inc.
2. DuPont Company; Fluorochemicals Div.
3. Honeywell, Inc.; Genetron Refrigerants.
4. INEOS Fluor Americas LLC.

B. ASHRAE 34, R-410A.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Suction Lines NPS 4 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.

B. Hot-Gas and Liquid Lines, and Suction Lines for Heat-Pump Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install service valves for gage taps at strainers if they are not an integral part of strainers.

B. nstall solenoid valves upstream from each expansion valve. Install solenoid valves in horizontal lines with coil at top.

C. Install thermostatic expansion valves as close as possible to distributors on evaporators.
1. Install valve so diaphragm case is warmer than bulb.
2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

D. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.

E. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.

F. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Refer to Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls" for solenoid valve controllers, control wiring, and sequence of operation.

K. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

L. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Division 08 Section "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.

M. Install refrigerant piping in protective conduit where installed belowground.

N. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

O. Slope refrigerant piping as follows:
1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
2. Install horizontal suction lines with a uniform slope downward to compressor.

3. Install traps and double risers to entrain oil in vertical runs.
4. Liquid lines may be installed level.

P. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

Q. Install pipe sleeves at penetrations in exterior walls and floor assemblies.

R. Seal penetrations through fire and smoke barriers according to Division 07 Section "Penetration Firestopping."

S. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

T. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.

U. Seal pipe penetrations through exterior walls according to Division 07 Section "Joint Sealants" for materials and methods.

3.4 PIPE JOINT CONSTRUCTION

A. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."

B. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.
2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:
1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet long.
2. Roller hangers and spring hangers for individual horizontal runs 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:
1. NPS 1/2: Maximum span, 60 inches; minimum rod size, 1/4 inch.
2. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4 inch.
3. NPS 1: Maximum span, 72 inches; minimum rod size, 1/4 inch.
4. NPS 1-1/4: Maximum span, 96 inches; minimum rod size, 3/8 inch.

5. NPS 1-1/2: Maximum span, 96 inches; minimum rod size, 3/8 inch.
6. NPS 2: Maximum span, 96 inches; minimum rod size, 3/8 inch.

D. Support multifloor vertical runs at least at each floor.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:
1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping and specialties. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
   a. Fill system with nitrogen to the required test pressure.
   b. System shall maintain test pressure at the manifold gage throughout duration of test.
   c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
   d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:
1. Install core in filter dryers after leak test but before evacuation.
2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
1. Open shutoff valves in condenser water circuit.
2. Verify that compressor oil level is correct.
3. Open compressor suction and discharge valves.
4. Open refrigerant valves except bypass valves that are used for other purposes.
5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

END OF SECTION

SECTION 23 31 13 – METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes metal, rectangular ducts and fittings for supply, return, outside, and exhaust air-distribution systems in pressure classes from minus 2- to plus 10-inch wg.

B. See Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 SUBMITTALS

A. Shop Drawings: Show fabrication and installation details for metal ducts.
   1. Penetrations through fire-rated and other partitions.
   2. Duct accessories, including access doors and panels.

1.3 QUALITY ASSURANCE

A. NFPA Compliance:
   1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
   2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SHEET METAL MATERIALS

A. Comply with 2007 California Mechanical Code for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Lock-forming quality; complying with ASTM A 653/A 653M and having G90 coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.

C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 SEALANT MATERIALS

A. Water-Based Joint and Seam Sealant: Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.

B. Flanged Joint Mastic: One-part, acid-curing, silicone, elastomeric joint sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

C. Flange Gaskets: Butyl rubber or EPDM polymer with polyisobutylene plasticizer.

2.4 HANGERS AND SUPPORTS

A. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
1. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
2. Exception: Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

B. Hanger Materials: Galvanized sheet steel or threaded steel rod.
1. Hangers Installed in Corrosive Atmospheres: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
2. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for steel sheet width and thickness and for steel rod diameters.

D. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

E. Trapeze and Riser Supports: Galvanized-steel shapes and plates complying with ASTM A 36/A 36M.

2.5 RECTANGULAR DUCT FABRICATION

A. Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction according to 2007 California Mechanical Code and complying with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure class.
2. Deflection: Duct systems shall not exceed deflection limits according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

B. Transverse Joints: Prefabricated slide-on joints and components constructed using manufacturer's guidelines for material thickness, reinforcement size and spacing, and joint reinforcement.
1. Manufacturers:
a. Ductmate Industries, Inc.

b. Nexus Inc.
c. Ward Industries, Inc.

C. Formed-On Flanges: Construct according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.
1. Manufacturers:
a. Ductmate Industries, Inc.
b. Lockformer.
2. Duct Size: Maximum 30 inches wide and up to 2-inch wg pressure class.
3. Longitudinal Seams: Pittsburgh lock sealed with noncuring polymer sealant.

D. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of nonbraced panel area unless ducts are lined.

PART 3 - EXECUTION

3.1 DUCT APPLICATIONS

A. Static-Pressure Classes: Unless otherwise indicated, construct ducts according to the following:
1. Supply Ducts: 1-inch wg.
2. Return Ducts (Negative Pressure): 1- inch wg.
3. Exhaust Ducts (Negative Pressure): 1-inch wg.

3.2 DUCT INSTALLATION

A. Construct and install ducts according to 2007 California Mechanical Code and unless otherwise indicated.

B. Install ducts with fewest possible joints.

C. Install fabricated fittings for changes in directions, size, and shape and for connections.

D. Install couplings tight to duct wall surface with a minimum of projections into duct. Secure couplings with sheet metal screws. Install screws at intervals of 12 inches, with a minimum of 3 screws in each coupling.

E. Install ducts, unless otherwise indicated, vertically and horizontally and parallel and perpendicular to building lines; avoid diagonal runs.

F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

G. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

H. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions unless specifically indicated.

I. Coordinate layout with suspended ceiling, fire- and smoke-control dampers, lighting layouts, and similar finished work.

J. Seal all joints and seams. Apply sealant to male end connectors before insertion, and afterward to cover entire joint and sheet metal screws.

K. Electrical Equipment Spaces: Route ducts to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

L. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls and are exposed to view, conceal spaces between construction openings and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts. Overlap openings on 4 sides by at least 1-1/2 inches.

M. Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, install appropriately rated fire dampers, sleeves, and firestopping sealant. Fire and smoke dampers are specified in Division 23 Section "Air Duct Accessories." Firestopping materials and installation methods are specified in Division 07 Section "Penetration Firestopping."

N. Protect duct interiors from the elements and foreign materials until building is enclosed. Follow SMACNA's "Duct Cleanliness for New Construction."

3.3 SEAM AND JOINT SEALING

A. Seal duct seams and joints according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for duct pressure class indicated.
   1. For pressure classes lower than 2-inch wg, seal transverse joints.

B. Seal ducts before external insulation is applied.

3.4 HANGING AND SUPPORTING

A. Support horizontal ducts within 24 inches of each elbow and within 48 inches of each branch intersection.

B. Support vertical ducts at maximum intervals of 16 feet and at each floor.

C. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

D. Install concrete inserts before placing concrete.

E. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
   1. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

3.5 CONNECTIONS

A. Make connections to equipment with flexible connectors according to Division 23 Section "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

END OF SECTION

SECTION 23 33 00 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Backdraft dampers.
2. Volume dampers.
3. Turning vanes.
4. Duct-mounting access doors.
5. Flexible connectors.
6. Flexible ducts.
7. Duct accessory hardware.

1.2 SUBMITTALS

A. Product Data: For the following:
1. Backdraft dampers.
2. Volume dampers.
3. Turning vanes.
4. Duct-mounting access doors.
5. Flexible connectors.
6. Flexible ducts.

1.3 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SHEET METAL MATERIALS

A. Comply with 2007 California Mechanical Code for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated.

B. Galvanized Sheet Steel: Lock-forming quality; complying with ASTM A 653/A 653M and having G90 coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.

C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 BACKDRAFT DAMPERS

A. Manufacturers:
1. Duro Dyne Corp.
2. Greenheck.
3. Ruskin Company.

B. Description: Multiple-blade, parallel action gravity balanced, with blades of maximum 6-inch width, with sealed edges, assembled in rattle-free manner with 90-degree stop, steel ball bearings, and axles; adjustment device to permit setting for varying differential static pressure.

C. Frame: 0.052-inch- thick, galvanized sheet steel, with welded corners and mounting flange.

D. Blades: 0.050-inch- thick aluminum sheet.

E. Blade Seals: Neoprene.

F. Blade Axles: Galvanized steel.

G. Tie Bars and Brackets: Galvanized steel.

H. Return Spring: Adjustable tension.

2.4 VOLUME DAMPERS

A. Manufacturers:
1. Flexmaster U.S.A., Inc.
2. METALAIRE, Inc.
3. Ruskin Company.

B. General Description: Factory fabricated, with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.

C. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, with linkage outside airstream, and suitable for horizontal or vertical applications.

1. Steel Frames: Hat-shaped, galvanized sheet steel channels, minimum of 0.064 inch thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls and flangeless frames where indicated for installing in ducts.
2. Roll-Formed Steel Blades: 0.064-inch- thick, galvanized sheet steel.
3. Blade Axles: Galvanized steel.
4. Bearings: Oil-impregnated bronze.
5. Tie Bars and Brackets: Galvanized steel.

D. Jackshaft: 1-inch- diameter, galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
1. Length and Number of Mountings: Appropriate to connect linkage of each damper in multiple-damper assembly.

E. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 3/4-inch hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

2.5 TURNING VANES

A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for vanes and vane runners. Vane runners shall automatically align vanes.

B. Manufactured Turning Vanes: Fabricate 1-1/2-inch- wide, single-vane, curved blades of galvanized sheet steel set 3/4 inch o.c.; support with bars perpendicular to blades set 2 inches o.c.; and set into vane runners suitable for duct mounting.
1. Manufacturers:
   a. Ductmate Industries, Inc.
   b. Duro Dyne Corp.
   c. Ward Industries, Inc.

C. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

2.6 DUCT-MOUNTING ACCESS DOORS

A. General Description: Fabricate doors airtight and suitable for duct pressure class.

B. Door: Double wall, duct mounting, and rectangular; fabricated of galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch butt or piano hinge and cam latches.
1. Manufacturers:
   a. Ductmate Industries, Inc.
   b. Greenheck.
   c. Nailor Industries Inc.
   d. Ward Industries, Inc.
2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
3. Provide number of hinges and locks as follows:
   a. Less Than 12 Inches Square: Secure with two sash locks.
   b. Up to 18 Inches Square: Two hinges and two sash locks.
   c. Up to 24 by 48 Inches: Three hinges and two compression latches with outside and inside handles.
   d. Sizes 24 by 48 Inches and Larger: One additional hinge.

C. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.

D. Insulation: 1-inch- thick, fibrous-glass or polystyrene-foam board.

2.7 FLEXIBLE CONNECTORS

A. Manufacturers:
1. Ductmate Industries, Inc.
2. Duro Dyne Corp.
3. Ward Industries, Inc.

B. General Description: Flame-retardant or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.

C. Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd..
2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
3. Service Temperature: Minus 40 to plus 200 deg F.

2.8 FLEXIBLE DUCTS

A. Manufacturers:
1. Flexmaster U.S.A., Inc.
2. Hart & Cooley, Inc.
3. McGill AirFlow Corporation.
4. Casco.

B. Noninsulated-Duct Connectors: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire.
1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 20 to plus 210 deg F.

C. Insulated-Duct Connectors: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor barrier film.
1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 10 to plus 160 deg F.

D. Flexible Duct Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action, in sizes 3 through 18 inches to suit duct size.

2.9 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts.

B. Provide duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

D. Install volume dampers in ducts with liner; avoid damage to and erosion of duct liner.

E. Provide balancing dampers at points on supply, return, and exhaust systems where branches lead from larger ducts as required for air balancing. Install at a minimum of two duct widths from branch takeoff.

F. Provide test holes at fan inlets and outlets and elsewhere as indicated.

G. Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units as follows:
   1. On both sides of duct coils.
   2. Downstream from volume dampers, turning vanes, and equipment.
   3. Adjacent to fire or smoke dampers, providing access to reset or reinstall fusible links.
   4. To interior of ducts for cleaning; before and after each change in direction, at maximum 50-foot spacing.
   5. On sides of ducts where adequate clearance is available.

H. Install the following sizes for duct-mounting, rectangular access doors:
   1. One-Hand or Inspection Access: 8 by 5 inches.
   2. Two-Hand Access: 12 by 6 inches.
   3. Head and Hand Access: 18 by 10 inches.
   4. Head and Shoulders Access: 21 by 14 inches.
   5. Body Access: 25 by 14 inches.
   6. Body Plus Ladder Access: 25 by 17 inches.

I. Install the following sizes for duct-mounting, round access doors:
   1. One-Hand or Inspection Access: 8 inches in diameter.
   2. Two-Hand Access: 10 inches in diameter.
   3. Head and Hand Access: 12 inches in diameter.
   4. Head and Shoulders Access: 18 inches in diameter.
   5. Body Access: 24 inches in diameter.

J. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment."

K. Install flexible connectors immediately adjacent to equipment in ducts associated with fans and motorized equipment supported by vibration isolators.

L. Connect diffusers or light troffer boots to low pressure ducts with maximum 60-inch lengths of flexible duct clamped or strapped in place.

M. Connect flexible ducts to metal ducts with draw bands.

3.2 ADJUSTING

A. Adjust duct accessories for proper settings.

B. Final positioning of manual-volume dampers is specified in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

END OF SECTION

SECTION 23 34 23 - HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Centrifugal roof ventilators.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Wiring Diagrams: For power, signal, and control wiring.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL ROOF VENTILATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Greenheck Fan Corporation.
   2. Loren Cook Company.
   3. Or Equal.

B. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.
   1. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.

C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

D. Belt Drives:
   1. Resiliently mounted to housing.

2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
5. Fan and motor isolated from exhaust airstream.

E. Accessories:
1. Variable-Speed Controller: Solid-state control to reduce speed from 100 to less than 50 percent.
2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.

F. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.
1. Configuration: Built-in cant and mounting flange.
2. Overall Height: 8 inches.
3. Sound Curb: Curb with sound-absorbing insulation.
4. Pitch Mounting: Manufacture curb for roof slope.
5. Metal Liner: Galvanized steel

2.2 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.

B. Enclosure Type: Totally enclosed, fan cooled.

2.3 SOURCE QUALITY CONTROL

A. Certify sound-power level ratings according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Secure roof-mounted fans to roof curbs with cadmium-plated hardware. See Division 07 Section "Roof Accessories" for installation of roof curbs.

B. Ceiling Units: Suspend units from structure; use steel wire or metal straps.

C. Support suspended units from structure using threaded steel rods and elastomeric hangers having a static deflection of 1 inch. Vibration-control devices are specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."

D. Install units with clearances for service and maintenance.

E. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories.
Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."

B. Install ducts adjacent to power ventilators to allow service and maintenance.

C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.
1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
1. Verify that shipping, blocking, and bracing are removed.
2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
3. Verify that cleaning and adjusting are complete.
4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
5. Adjust belt tension.
6. Adjust damper linkages for proper damper operation.
7. Verify lubrication for bearings and other moving parts.

8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
10. Shut unit down and reconnect automatic temperature-control operators.
11. Remove and replace malfunctioning units and retest as specified above.

C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.

D. Replace fan and motor pulleys as required to achieve design airflow.

E. Lubricate bearings.

END OF SECTION

SECTION 23 37 13 – DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Rectangular and square ceiling diffusers
2. Louver face diffusers
3. Fixed face grilles

B. Related Sections:
1. Division 08 Section "Louvers and Vents" for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.
2. Division 23 Section "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated, include the following:
1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

A. Rectangular and Square Ceiling Diffusers CD-1:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Krueger
b. METALAIRE, Inc
c. Price Industries
d. Titus
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel
4. Finish: Baked enamel, white
5. Face Size: 24 by 24 inches
6. Face Style: Plaque
7. Mounting: As required for ceiling type, concealed hardware.
8. Pattern: Adjustable
9. Accessories:
a. Plaster ring

B. Louver Face Diffuser SWS:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. METALAIRE, Inc.
   b. Price Industries
   c. Titus
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel
4. Finish: Baked enamel, white
5. Face Size: See plans
6. Mounting: As required for soffit type, concealed hardware.
7. Pattern: Adjustable core style

2.2 REGISTERS AND GRILLES

A. Fixed Face Grille RG-1/EG-1/TG-1/SWR
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Krueger
   b. METALAIRE, Inc
   c. Price Industries
   d. Titus
2. Material: Steel
3. Finish: Baked enamel, white
4. Face Arrangement: ¾" blades spacing at 30 to 40 degree angle
5. Frame: 1 inch wide
6. Mounting: As required for ceiling or soffit type, concealed hardware.
7. Accessories:
   a. Plaster frame.

2.3 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.2 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

SECTION 23 41 00 – PARTICULATE AIR FILTRATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes factory-fabricated air-filter devices and media used to remove particulate matter from air for HVAC applications.

1.2 SUBMITTALS

A. Product Data: Include dimensions; required clearances and access; rated flow capacity, including initial and final pressure drop at rated airflow; efficiency and test method; fire classification; furnished specialties; and accessories for each unit indicated.

B. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Comply with ARI 850.

B. Comply with ASHRAE 52.1 and ASHRAE 52.2 for method of testing and rating air-filter units.

C. Comply with NFPA 90A and NFPA 90B.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Airguard Industries, Inc.
2. Farr Co.
3. Flanders Filters, Inc.

E. Disposable Panel Filters: MERV 13, factory-fabricated, viscous-coated, flat-panel-type, disposable air filters with holding frames.
1. Media: Interlaced glass fibers sprayed with nonflammable adhesive.
2. Frame: Cardboard frame with perforated metal retainer.
3. Duct-Mounting Frames: Welded, galvanized steel with gaskets and fasteners and suitable for bolting together into built-up filter banks.

F. Extended-Surface, Disposable Panel Filters: Factory-fabricated, dry, extended-surface filters with holding frames.
1. Media: Fibrous material formed into deep-V-shaped pleats and held by self-supporting wire grid.
2. Media and Media-Grid Frame: Nonflammable cardboard.

3. Duct-Mounting Frames: Welded, galvanized steel with gaskets and fasteners, and suitable for bolting together into built-up filter banks.

3.1 INSTALLATION

G. Position each filter unit with clearance for normal service and maintenance. Anchor filter holding frames to substrate.

H. Install filters in position to prevent passage of unfiltered air.

I. Coordinate filter installations with duct and air-handling unit installations.

END OF SECTION

SECTION 23 81 27 – VARIABLE FLOW SPLIT-SYSTEM HEAT PUMP, BRANCH CONTROLLER AND FAN COIL UNITS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

B. The variable capacity, heat pump heat recovery air conditioning system shall be a Mitsubishi Electric CITY MULTI VRF (Variable Refrigerant Flow). The CITY MULTI VRF systems shall be the R2-Series (simultaneous cooling and heating) split system heat pump.

The R2-Series system shall consist of a PURY outdoor unit, BC (Branch Circuit) Controller, multiple indoor units, and M-NET DDC (Direct Digital Controls). Each indoor unit or group of indoor units shall be capable of operating in any mode independently of other indoor units or groups. System shall be capable of changing mode (cooling to heating, heating to cooling) with no interruption to system operation. To ensure owner comfort, each indoor unit or group of indoor units shall be independently controlled and capable of changing mode automatically when zone temperature strays 1.8 degrees F from set point for ten minutes. The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of outdoor rated capacity.

The Mitsubishi City Multi system is the basis of design for this project and as such the piping systems, electrical systems, drains, equipment space (including service space), and equipment capacities are unique to the Mitsubishi City Multi system.

1.2 SUBMITTAL

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

C. Operation and maintenance data.

D. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.

B. All wiring shall be in accordance with the California Electrical Code (C.E.C.).

C. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).

D. A full charge of R-410A for the condensing unit only shall be provided in the condensing unit.

1.4 DELIVERY, STORAGE AND HANDLING

A. Unit shall be stored and handled according to the manufacturer's recommendation.

1.5 WARRANTY

A. The units shall be covered by the manufacturer's limited warranty for a period of one (1) year from date of acceptance. The system must be:
   1. Installed by a certified CITY MULTI Diamond Dealer, AND
   2. Verified with a completed commissioning report submitted to and approved by the Mitsubishi Electric Service Department.

   Then the units shall be covered by an extended manufacturer's limited warranty for a period of ten (10) years from date of acceptance.

   In addition the compressor shall have a manufacturer's limited warranty for a period of ten (10) years from date of acceptance.

   If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

   All manufacturer technical and service manuals must be readily available for download by any local contractor should emergency service be required. Registering and sign-in requirements which may delay emergency service reference are not allowed.

   Prior to bid, the Contractor shall be an authorized CITY MULTI Diamond Dealer. Contractor shall have a certificate of service training completion from the CITY MULTI Diamond Dealer service training. The mandatory contractor service and install training should be performed by the manufacturer. The CITY MULTI VRFZ system shall be installed by a Mitsubishi authorized CITY MULTI Diamond Dealer with at least 2 years of CITY MULTI install and service training. Proof of training shall be submitted to the Engineer for approval.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Basic-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings:
   1. Mitsubishi Electric & Electronics USA, Inc.; HVAC Advanced Products Division.
   2. No Equal.

2.2 R2-SERIES OUTDOOR UNIT: HP-1, HP-2, HP-3 AND HP-4

A. General:

The R2-Series PURY outdoor unit shall be used specifically with CITY MULTI VRF components. The PURY outdoor units shall be equipped with multiple circuit boards that interface to the M-NET controls system and shall perform all functions necessary for operation. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.

1. Capacities and Characteristics: See equipment schedule on plans.
2. Outdoor unit shall have a sound rating no higher than 60 dB(A) individually or 64 dB(A) twinned. Units shall have a sound rating no higher than 50 dB(A) individually or 53 dB(A) twinned while in night mode operation. If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.
3. Both refrigerant lines from the outdoor unit to the BC (Branch Circuit) Controller (Single or Main) shall be insulated in accordance with the installation manual.
4. There shall be no more than 3 branch circuit controllers connected to any one outdoor unit.
5. Outdoor unit shall be able to connect to up to 50 indoor units depending upon model.
6. The outdoor unit shall have an accumulator with refrigerant level sensors and controls.
7. The outdoor unit shall have a high pressure safety switch, over-current protection, crankcase heater and DC bus protection.
8. The outdoor unit shall have the ability to operate with a maximum height difference of 164 feet and have total refrigerant tubing length of 1804-2625 feet. The greatest length is not to exceed 541 feet between outdoor unit and the indoor units without the need for line size changes or traps.
9. The outdoor unit shall be capable of operating in heating mode down to -4°F ambient temperatures or cooling mode down to 23°F ambient temperatures, without additional low ambient controls.
10. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.
11. Unit must defrost all circuits simultaneously in order to resume full heating more quickly. Partial defrost which may extend “no or reduced heating” periods shall not be allowed.
12. Equipment must be labeled “Assembled in USA” on equipment nameplate. Manufacturer must provide documentation from U.S. Customs and Border Protection indicating the equipment is a product of the U.S.

B. Unit Cabinet:
1. The casing(s) shall be fabricated of galvanized steel, bonderized and finished. Units cabinets shall be able to withstand 960 hours per ASTM B117 criteria for seacoast protected models (–BS models)

C. Fan:
1. Each outdoor unit module shall be furnished with one direct drive, variable speed propeller type fan. The fan shall be factory set for operation under 0 in. WG external static pressure, but capable of normal operation under a maximum of 0.24 in. WG external static pressure via dipswitch.
2. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.
3. All fan motors shall be mounted for quiet operation.
4. All fans shall be provided with a raised guard to prevent contact with moving parts.
5. The outdoor unit shall have vertical discharge airflow.

D. Refrigerant

1. R410A refrigerant shall be required for PURY-P-TL MU-A and PURY-P-TLS MU-A outdoor unit systems.
2. Polyolester (POE) oil shall be required.

E. Coil:
1. The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
2. The coil shall be protected with an integral metal guard.
3. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.
4. The outdoor coil shall include 4 circuits with two position valves for each circuit, except for the last stage.

F. Compressor:
1. Each outdoor unit module shall be equipped with one inverter driven scroll hermetic compressor. Non inverter-driven compressors, which cause inrush current (demand charges) and require larger wire sizing, shall not be allowed.
2. A crankcase heater(s) shall be factory mounted on the compressor(s).
3. The outdoor unit compressor shall have an inverter to modulate capacity.
4. The compressor will be equipped with an internal thermal overload protection.
5. The compressor shall be mounted to avoid the transmission of vibration.
6. Field-installed oil equalization lines between modules are not allowed.

G. Controls:
1. The outdoor unit shall have the capability of up to 8 levels of demand control for each refrigerant system

H. Electrical:
1. See equipment schedule on plans for electrical power requirements.
2. The outdoor unit shall be controlled by integral microprocessors.
3. The control circuit between the indoor units, BC Controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

2.3 BRANCH CIRCUIT (BC) CONTROLLERS FOR R2-SERIES SYSTEMS

A. General

The BC (Branch Circuit) Controllers shall include multiple branches to allow simultaneous heating and cooling by allowing either hot gas refrigerant to flow to indoor unit(s) for heating or subcooled liquid refrigerant to flow to indoor unit(s) for cooling. Refrigerant used for cooling must always be subcooled for optimal indoor unit Linear Expansion Valve (LEV) LEV performance; alternate branch devices with no subcooling risk bubbles in liquid supplied to LEV are not allowed.

The BC (Branch Circuit) Controllers shall be specifically used with R410A R2-Series systems. These units shall be equipped with a circuit board that interfaces to the M-NET controls system and shall perform all functions necessary for operation. The unit shall have a galvanized steel finish. The BC Controller shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. This unit shall be mounted indoors, with access and service clearance provided for each controller. The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of rated capacity. The BC Controller shall be suitable for use in plenums in accordance with UL1995 edition 4.

B. BC Unit Cabinet:
1. The casing shall be fabricated of galvanized steel.
2. Each cabinet shall house a liquid-gas separator and multiple refrigeration control valves.
3. The unit shall house two tube-in-tube heat exchangers.

C. Refrigerant
1. R410A refrigerant shall be required.

D. Refrigerant Branches
1. All BC controller refrigerant pipe connections shall be brazed or flared.

E. Refrigerant valves:
1. The unit shall be furnished with multiple branch circuits which can individually accommodate up to 54,000 BTUH and up to three indoor units. Branches may be twinned to allow more than 54,000 BTUH.
2. Each branch shall have multiple two-position valves to control refrigerant flow.
3. Service shut-off valves shall be field-provided/installed for each branch to allow service to any indoor unit without field interruption to overall system operation.
4. Linear electronic expansion valves shall be used to control the variable refrigerant flow.

F. Integral Drain Pan:
1. An Integral drain pan and drain shall be provided

G. Electrical:
1. See equipment schedule on plans for electrical power requirement.
2. The BC Controller shall be controlled by integral microprocessors
3. The control circuit between the indoor units and outdoor units shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

2.4 PEFY-P**-NMHU – E* (CEILING-CONCEALED DUCTED) INDOOR UNIT

A. General:

The PEFY shall be a ceiling-concealed ducted indoor fan coil design that mounts above the ceiling with a 2-position, field adjustable return and a fixed horizontal discharge supply and shall have a modulating linear expansion device. The PEFY shall be used with the R2-Series outdoor unit and BC Controller, Y-Series outdoor unit, or S-Series outdoor unit. The PEFY shall support individual control using M-NET DDC controllers. Units shall have the capability to control supplemental heat. The unit shall be suitable for use in plenums in accordance with UL 1995 edition 4.

B. Indoor Unit.

The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

C. Unit Cabinet:

1. The unit shall be, ceiling-concealed, ducted.
2. The cabinet panel shall have provisions for a field installed filtered outside air intake.

D. Fan:
1. PEFY-NMAU models shall feature external static pressure settings from 0.14 to 1.0 in. WG.
2. The indoor unit fan shall be an assembly with one or two Sirocco fan(s) direct driven by a single motor.
3. The indoor fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings.
4. The indoor fan shall consist of three (3) speeds, High, Mid, and Low plus the Auto-Fan function
5. The indoor unit shall have a ducted air outlet system and ducted return air system.

E. Filter:
1. Return air shall be filtered by means of a standard factory installed return air filter.

F. Coil:
1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The tubing shall have inner grooves for high efficiency heat exchange.
3. All tube joints shall be brazed with phos-copper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A condensate pan and drain shall be provided under the coil.
6. The condensate shall be gravity drained from the fan coil.
7. Both refrigerant lines to the PEFY indoor units shall be insulated in accordance with the installation manual.

G. Electrical:
1. See equipment schedule on plans for power requirements.

H. Controls:
1. This unit shall use controls provided by Mitsubishi Electric Cooling & Heating to perform functions necessary to operate the system. Please refer to Part 2.6 Controls of this guide specification for details on controllers and other control options.
2. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
3. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
4. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
5. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.
6. Thermostat shall be compatible.

2.5 PLFY-P**NEMU-E* (4-WAY CEILING-RECESSED CASSETTE WITH GRILLE) INDOOR UNIT

A. General:

1. The PLFY-P**NEMU-E* shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

B. Unit Cabinet:
1. The cabinet shall be a compact 22-7/16” wide x 22-7/16” deep so it will fit within a standard 24” square suspended ceiling grid.
2. The cabinet panel shall have provisions for a field installed filtered outside air intake.
3. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow.

C. Fan:
1. The indoor fan shall be an assembly with a turbo fan direct driven by a single motor.
2. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
3. The indoor fan shall consist of three (3) speeds, Low, Mid, and High.
4. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.
5. The auto air swing vanes shall be capable of automatically swinging up and down for uniform air distribution.
6. Thermostat shall be compatible with the fan coil unit.

D. Filter:
1. Return air shall be filtered by means of a long-life washable filter.

E. Coil:
1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The tubing shall have inner grooves for high efficiency heat exchange.
3. All tube joints shall be brazed with phos-copper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A condensate pan and drain shall be provided under the coil.
6. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 19-3/4” inches above the condensate pan.
7. Both refrigerant lines to the PLFY indoor units shall be insulated in accordance with the installation manual.

F. Electrical:
1. See equipment schedule on plans.

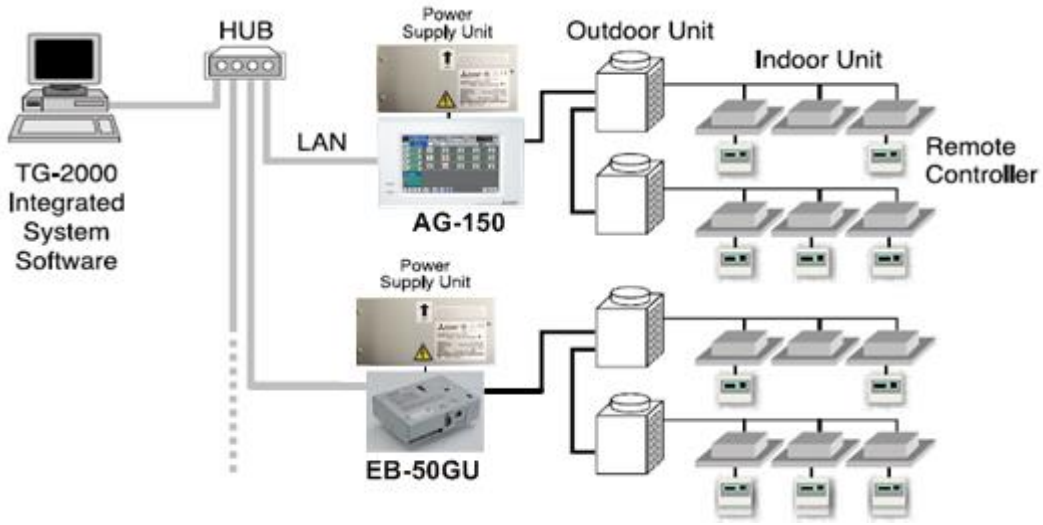
G. Controls:
1. This unit shall use controls provided by Mitsubishi Electric to perform functions necessary to operate the system.
2. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.

3. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
4. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
5. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.
6. Thermostat shall be compatible with the fan coil unit.

2.6 CONTROLS

A. General:

The CITY MULTI Controls Network (CMCN) consists of remote controllers, centralized controllers, and/or integrated web based interface communicating over a high-speed communication bus. The CITY MULTI Controls Network shall support operation monitoring, scheduling, occupancy, error email distribution, personal web browsers, tenant billing, online maintenance support, and integration with Building Management Systems (BMS) using either LonWorks® or BACnet® interfaces. The below figure illustrates a sample CMCN System Configuration.



CMCN System Configuration

B. Electrical Characteristics
1. General:

The CMCN shall operate at 30VDC. Controller power and communications shall be via a common non-polar communications bus.

2. Wiring:
   a. Control wiring shall be installed in a daisy chain configuration from indoor unit to indoor unit, to the BC controller (main and subs, if applicable) and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit.

b. Control wiring for the Smart ME remote controller shall be from the remote controller to the first associated indoor unit (TB-5) M-NET connection. The Smart ME remote controller shall be assigned an M-NET address.
c. Control wiring for the Simple MA and Wireless MA remote controllers shall be from the remote controller (receiver) to the first associated indoor unit (TB-15) then to the remaining associated indoor units (TB-15) in a daisy chain configuration.
d. Control wiring for centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to the system controllers (centralized controllers and/or integrated web based interface), to the power supply.
e. The AE-200, AE-50, and EB-50GU centralized controller shall be capable of being networked with other AE-200, AE-50, and EB-50GU centralized controllers for centralized control.

3. Wiring type:
a. Wiring shall be 2-conductor (16 AWG), twisted, stranded, shielded wire as defined by the Diamond System Builder output.
b. Network wiring shall be CAT-5 with RJ-45 connection.
c. CITY MULTI Controls Network

C. CMCN: Remote Controller

Backlit Simple ME Remote Controller (PAR-U01MEDU)

The Backlit Simple ME Remote Controller (PAR-U01MEDU) shall be capable of controlling up to 16 indoor units (defined as 1 group). The Backlit Simple ME Remote Controller shall be compact in size, approximately 3” x 5” and have limited user functionality. The Backlit Simple ME supports temperature display selection of Fahrenheit. The Backlit Simple ME Remote Controller shall allow the user to change on/off, mode (cool, heat, auto (R2/WR2-Series only), dry, setback (R2/WR2-Series only) and fan), temperature setting, and fan speed setting and airflow direction. The Backlit Simple ME Remote Controller shall be able to limit the set temperature range from the Backlit Simple ME. The Backlit Simple ME Remote controller shall be capable of night setback control with upper and lower set temperature settings. The room temperature shall be sensed at either the Backlit Simple ME Remote Controller or the Indoor Unit dependent on the indoor unit dipswitch setting. The Backlit Simple ME Remote Controller shall display a four-digit error code in the event of system abnormality/error.

The Backlit Simple ME Remote Controller shall only be used in same group with Wireless ME Remote Controllers (PAR-FL32MA-E / PAR-FA32MA-E) or with other Backlit Simple MA Remote Controllers (PAC-YT53CRAU), with up to two remote controllers per group.

The Backlit Simple MA Remote Controller shall require no addressing. The Backlit Simple MA Remote Controller shall connect using two-wire, stranded, non-polar control wire to TB15 connection terminal on the indoor unit. The Simple MA Remote Controller shall require cross-over wiring for grouping across indoor units.

PAR-U01MEDU (Smart ME Remote Controller)			
Item	Description	Operation	Display

PAR-U01MEDU (Smart ME Remote Controller)			
Item	Description	Operation	Display
ON/OFF	Run and stop operation for a single group	Each Group	Each Group
Backlight	Turns on when screen is touched. Timeout duration is adjustable.	Each Group	Each Group
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat/Setback. Operation modes vary depending on the air conditioner unit. Auto and Setback mode are available for the R2/WR2-Series only.	Each Group	Each Group
Temperature Setting	Sets the temperature from 40°F – 95°F depending on operation mode and indoor unit. Separate COOL and HEAT mode set points available depending on central controller and connected mechanical equipment.	Each Group	Each Group
Fan Speed Setting	Available fan speed settings depending on indoor unit.	Each Group	Each Group
Air Flow Direction Setting	Air flow direction settings vary depending on the indoor unit model.	Each Group	Each Group
Room Temp and Humidly Display	Displays the room temperature and humidity on the Home screen. Temperature and Humidity sensed can be calibrated using the sensor offset in 1 °F or 1% RH increments.	N/A	Each Group
Occupancy Sensor	Detects occupancy using an infrared motion sensor. Occupancy status is indicated on the remote controller and through the web interface depending on connected equipment. Sensitivity is adjustable.	N/A	Each Group
Brightness Sensor	Detects brightness in the space and indicates brightness on the remote controller and through the web browser interface depending on connected equipment. Sensitivity is adjustable.	N/A	Each Group
Status Monitor	Displays the status of general equipment control points connected to the Advanced HVAC Controller (DC-A210).	N/A	Each Group
Humidity Setting	Sets the relative humidity set point in 1% increments for any humidifier connected to the Advanced HVAC Controller (DC-A210).	Each Group	Each Group
LED Indicator	Can be set to indicate the operation status by lighting and flashing with different colors and brightness or by turning off to signal operation mode, stopped unit, error, occupancy, or home screen button pushes. Color can be set to indicate the current mode selected or room temp range being sensed. *Available colors include blue, light blue, yellow, white, green, red, and lime.	Each Group	Each Group
Schedule	Set up to 8 operations per day, 7 days per week. Operations include time on/off, mode and room temperature set point.	Each Group	Each Group

PAR-U01MEDU (Smart ME Remote Controller)			
Item	Description	Operation	Display
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Fan Speed, Air Direction, Reset filter). *1: Operation icon light up on the remote controller for prohibited functions.	N/A	Each Group *1
Energy-Save Control During Vacancy	When vacancy is detected by the occupancy sensor 5 control options are available for selection: Stop/Setback Mode/Set Temperature Offset/Low Fan Speed/thermos-off Brightness sensor can be used in conjunction with the occupancy sensor to increase accuracy.	Each Group	Each Group
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed	N/A	Each Unit
Test Run	Operates air conditioner units in test run mode.	Each Group	Each Group
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.	Each Group	Each Group
Set Temperature Range Limit	Set temperature range limit for auto, cool, (drying) and heat modes.	Each Group	Each Group
Operation Lock Out Function	Locking of ON/OFF, Mode, Set Temp, Hold Button, and Air Direction.	Each Group	Each Group
Password	User and Service password protections are available	Each Group	N/A
Hold	Hold Prohibits the schedule operation from being executed a. ON/OFF timer b. Auto-OFF timer c. Weekly timer d. Automatic return to the preset temperature *While an operation is prohibited by Hold function, the operation icon light up.	Each Group	Each Group

D. Centralized Controller (Web-enabled)

1. AE-200 Centralized Controller

The AE-200A Centralized Controller shall be capable of controlling a maximum of two hundred (200) indoor units across multiple CITY MULTI outdoor units with the use of three (3) AE-50A expansion controllers. The AE-200A Centralized Controller shall be approximately 11-5/32” x 7-55/64” x 2-17/32” in size and shall be powered with an integrated 100-240 VAC power supply. The AE-200A Centralized Controller shall support system configuration, daily/weekly scheduling, monitoring of operation status, night setback settings, free contact interlock configuration and malfunction monitoring. When being used alone without the expansion controllers, the AE-200A Centralized Controller shall have five basic operation controls which can be applied to an individual indoor unit, a collection of indoor units (up to 50 indoor units), or all indoor units (collective batch operation). This basic set of operation controls for the

AE-200 Centralized Controller shall include on/off, operation mode selection (cool, heat, auto (R2/WR2-Series only), dry, setback (R2/WR2-Series only) and fan), temperature setting, fan speed setting, and airflow direction setting. Since the AE-200A provides centralized control it shall be able to enable or disable operation of local remote controllers. In terms of scheduling, the AE-200A Centralized Controller shall allow the user to define both daily and weekly schedules (up to 24 scheduled events per day) with operations consisting of ON/OFF, mode selection, temperature setting, air flow (vane) direction, fan speed, and permit/prohibit of remote controllers.

AE-200 (Centralized Controller)			
Item	Description	Operation	Display
ON/OFF	Run and stop operation.	Each Block, Group or Collective	Each Group or Collective
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat. (Group of Lossnay unit: automatic ventilation/vent-heat/interchange/normal ventilation) Operation modes vary depending on the air conditioner unit. Auto mode is available for the R2/WR2-Series only.	Each Block, Group or Collective	Each Group
Temperature Setting	Sets the temperature from 57°F – 87°F depending on operation mode and indoor unit.	Each Block, Group or Collective	Each Group
Fan Speed Setting	Available fan speed settings depending on indoor unit.	Each Block, Group or Collective	Each Group
Air Flow Direction Setting	Air flow direction settings vary depending on the indoor unit model. *1. Louver cannot be set.	*1 Each Block, Group or Collective	Each Group
Schedule Operation	Annual/weekly/today schedule can be set for each group of air conditioning units. Optimized start setting is also available. *1. The system follows either the current day, annual schedule, or weekly, which are in the descending order of overriding priority. Twenty-four events can scheduled per day, including ON/OFF, Mode, Temperature Setting, Air Direction, Fan Speed and Operation Prohibition. Five types of weekly schedule (seasonal) can be set. Settable items depend on the functions that a given air conditioning unit supports.	*2 Each Block, Group or Collective	Each Group
Optimized Start	Unit starts 5 - 60 minutes before the scheduled time based on the operation data history in order to reach the scheduled temperature at the scheduled time.	Each Block, Group or Collective	Each Block, Group or Collective

AE-200 (Centralized Controller)			
Item	Description	Operation	Display
Night Setback Setting	The function helps keep the indoor temperature in the temperature range while the units are stopped and during the time this function is effective.	Each Group	Each Group
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Reset filter). *3. Centrally Controlled is displayed on the remote controller for prohibited functions.	Each Block, Group or Collective	*3 Each Group
Room Temp	Displays the room temperature of the group. Space temperature displayed on the indoor unit icon on the touch screen interface.	N/A	Each Group
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed *4. When an error occurs, the LED flashes. The operation monitor screen shows the abnormal unit by flashing it. The error monitor screen shows the abnormal unit address, error code and source of detection. The error log monitor screen shows the time and date, the abnormal unit address, error code and source of detection	N/A	*4 Each Unit or Collective
Outdoor Unit Status	Compressor capacity percentage and system pressure (high and low) pressure (excludes S-Series)	Each ODU	Each ODU
Connected Unit Information	MNET addresses of all connected systems	Each IDU, ODU and BC	Each IDU, ODU and BC
Ventilation Equipment	This interlocked system settings can be performed by the master system controller. When setting the interlocked system, use the ventilation switch the free plan LOSSNAY settings between “Hi”, “Low” and “Stop”. When setting a group of only free plan LOSSNAY units, you can switch between “Normal ventilation”, “Interchange ventilation” and “Automatic ventilation”.	Each Group	Each Group
Multiple Language	Other than English, the following language can be chosen. Spanish, French, Japanese, Dutch, Italian, Russian, Chinese, and Portuguese are available.	N/A	Collective
External Input / Output	By using accessory cables you can set and monitor the following. Input By level: “Batch start/stop”, “Batch emergency stop” By pulse: “batch start/stop”, “Enable/disable remote controller” Output: “start/stop”, “error/Normal” *5. Requires the external I/O cables (PAC-YG10HA-E) sold separately.	*5 Collective	*5 Collective

All AE-200A Centralized Controllers shall be equipped with two RJ-45 Ethernet ports to support interconnection with a network PC via a closed/direct Local Area Network (LAN) or to a network switch for IP communication to up to three AE-50A expansion controllers for display of up to two hundred (200) indoor units on the main AE-200A interface.

The AE-200A Centralized Controller shall be capable of performing initial settings via the high-resolution, backlit, color touch panel on the controller or via a PC browser using the initial settings.

Standard software functions shall be available so that the building manager can securely log into each AE-200A via the PC's web browser to support operation monitoring, scheduling, error email, interlocking and online maintenance diagnostics. Additional optional software functions of personal browser for PCs and MACs and Tenant Billing shall be available but are not included. The Tenant Billing function shall require TG-2000 Integrated System software in conjunction with the Centralized Controllers.

E. AE-50A Expansion Controller

The AE-50A shall serve as a standalone centralized controller or as an expansion module to the AE-200A Centralized Controller for the purpose of adding up to 50 indoor units to either the main touch screen interface of the AE-50A. Up to three (3) AE-50A expansion controllers can be connected to the AE-50A via a local IP network (and their IP addresses assigned on the AE-200A) to the AE-50A interface.

The AE-50A expansion controllers have all the same capabilities to monitor and control their associated indoor units as the features specified above. Even when connected to the AE-200A and configured to display their units on the main controller, the individual indoor units connected to the AE-50A can still be monitored and controlled from the interface of the AE-50. The last command entered will take precedence, whether at the wall controller, the AE-50A or the AE-200A Centralized Controller.

CMCN: System Integration

The CMCN shall be capable of supporting integration with Building Management Systems (BMS).

1. BAC-HD150: BACnet® Interface

The Mitsubishi Electric Cooling & Heating BACnet® interface, BAC-HD150, shall be compliant with BACnet® Protocol (ANSI/ASHRAE 135-2004) and be Certified by the (BTL) BACnet® Testing Laboratories. The BACnet® interface shall support BACnet Broadcast Management (BBMD). The BACnet® interface shall support a maximum of 50 indoor units. Operation and monitoring points include, but are not limited to, on/off, operation mode, fan speed, prohibit remote controller, filter sign reset, alarm state, error code, and error address.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
Rig and install in full accordance with manufacturer's requirements, project drawings, and contract documents. Refer to the manufacturer's installation manual for full requirements.

B. Location:
Locate indoor and outdoor units as indicated on drawings. Provide service clearance per manufacturer's installation manual. Adjust and level outdoor units on support structure.

C. Components / Piping:

Installing contractor shall provide and install all accessories and piping for a fully operational system. Refer to manufacturer's installation manual for full instructions.

Traps, filter driers, and sight glasses are NOT to be installed on the refrigerant piping or condensate lines.

Standard ACR fittings rated for use with R410A are to be used for all connections. Proprietary manufacturer-specific appurtenances are not allowed.

Refrigerant pipe for CITY MULTI shall be made of phosphorus deoxidized copper, and has two types.

1. ACR "Annealed": Soft copper pipe, can be easily bent with human's hand.
2. ACR "Drawn Temper": Hard copper pipe (Straight pipe), being stronger than Type-O pipe of the same radical thickness.

The maximum operation pressure of R410A air conditioner is 4.30 MPa [623psi] . The refrigerant piping should ensure the safety under the maximum operation pressure. Refer to recommend piping specifications in Mitsubishi Electric's engineering manual. Pipes of radical thickness 0.7mm or less shall not be used.

Flare connection should follow dimensions provided in manufacturer's installation manuals.

D. Insulation:

Refrigerant lines, as well as any valves, shall be insulated end to end with ½" closed-cell pipe insulation for piping up to 1"in diameter, or ¾" for piping 1-1/8" and larger, with a thermal conductivity no greater than 0.27 BTU-in/hr sq.ft ^{o}F. If state or local codes require insulation other than that specified above, the greater insulation shall be used.

E. Electrical:

Installing contractor shall coordinate electrical requirements and connections for all power feeds with electrical contractor. Refer to Division 26 for additional information.

F. Third Party Controls:

Installing contractor shall coordinate all BAS/BMS control requirements and connections with controls contractor.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

C. Duct Connections: Duct installation requirements are specified in Section 23 31 13 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 23 33 00 "Air Duct Accessories."

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:
1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace malfunctioning units and retest as specified above.

C. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Perform startup service.
1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION

SECTION 26 01 00 – BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 SCOPE

A. This section supplements all sections of this division and shall apply to all phases of work hereinafter specified, shown on the drawings, or required to provide a complete installation of electrical systems for the Project. The work required under this division is not limited to the electrical specifications and drawings. Refer to all bid documents including Civil, Architectural, Structural, and Mechanical documents which may designate Work to be accomplished. The intent of the Specifications is to provide a complete and operable electrical system, which shall include all documents that are a part of the entire Project Contract.
   1. Work included: Furnish all labor, material, tools, equipment, facilities, transportation, skilled supervision necessary for, and incidental to, performing operations in connection with furnishing, delivery, and installation of the work in this division complete as shown or noted on the Drawings and specified herein.

B. Related Work Specified Elsewhere:
   1. Refer to all sections in the general contract conditions, Contract Requirements and Division 01, General Requirements.
   2. Refer to Mechanical and Plumbing drawing wiring diagrams for additional information required for this project.

C. Work Installed but Furnished by Others:
   1. The electrical work includes the installation or connection of certain materials and equipment furnished by others. Verify installation details. Foundations for apparatus and equipment will be furnished by others unless otherwise noted or detailed.

1.2 GENERAL REQUIREMENTS

A. Guarantee See General Conditions:
   1. Except as may be specified under other Sections in the specification, guarantee equipment furnished under the specifications for a period of one year, except for equipment required to have a longer guarantee period, from date of final completion. Guarantee all work against defective workmanship, material, and improper installation. Upon notification of failure, correct deficiency immediately and without additional cost to the Owner.
   2. Standard warranty of manufacturer shall apply for replacement of parts after expiration of the above period. Manufacturer shall furnish replacement parts to the Owner or his service agency as approved. Furnish to the Owner, through the Architect, printed manufacturer's warranties complete with material included and expiration dates, upon completion of project. Conform to Division 01.

B. Equipment Safety: All electrical materials and equipment shall be new and shall be listed by Underwriter's Laboratories and bear their label or listed and certified by a nationally recognized testing authority where UL does not have an approval. Custom made equipment must have complete test data submitted by the manufacturer attesting to its safety.

C. Codes and Regulations:
1. Design, manufacturer, testing and method of installation of all apparatus and materials furnished under the requirements of these specifications shall conform to the latest publications or standard rules of the following:
   a. Institute of Electrical and Electronic Engineers - IEEE
   b. National Electrical Manufacturers' Association - NEMA
   c. Underwriters' Laboratories, Inc. - UL
   d. National Fire Protection Association - NFPA
   e. American Society for Testing and Materials - ASTM
   f. American National Standards Institute - ANSI
   g. California Electrical Code – CEC, Title 24, Part 3
   h. California Code of Regulations, Title 8, Subchapter 5
   i. California Building Code-CBC, Title 24 Parts 1 &2
   j. State & Municipal Codes in Force in the Specific Project Area
   k. Occupational Safety & Health Administration – OSHA
   l. California State Fire Marshal
   m. California Fire Code- CFC, Title 24 Part 9
   n. National Electrical Testing Association – NETA
2. The term "Code", when used within the specifications, shall refer to the Publications, Standards, ordinances and codes, listed above. In the case where the codes have different levels of requirements the most stringent rules shall apply.

D. Requirements of Regulatory Agencies:
1. Codes, Permits, and Fees: Where the Contract Documents exceed minimum requirements, the Contract Documents take precedence. Where code conflicts occur, the most stringent shall apply. The most stringent condition shall be as interpreted by the Engineer.
   a. Comply with all requirements for permits, licenses, fees and Code. Permits, licenses, fees, inspections and arrangements required for the Contractor at his expense shall obtain the Work, unless otherwise specified.
   b. Comply with the requirements of the applicable utility companies serving the Project. Make all arrangements with the utility companies for proper coordination of the Work.

E. Shop Drawings:
1. See Division 01 for additional requirements.
2. Time Schedules for Submission and Ordering: The Contractor shall prepare, review and coordinate his schedule of submissions carefully, determining the necessary lead time for preparing, submitting, checking, ordering and delivery of materials and equipment for timely arrival. The Contractor shall be responsible for conformance with the overall construction schedule.
3. Submittals will be checked for general compliance with specifications only. The Contractor shall be responsible for deviations from the drawings or specifications and for errors or omissions of any sort in submittals.
4. Submit a complete list of materials and equipment proposed for the job, including manufacturers names and catalog numbers.
5. Shop drawings shall be submitted in completed groups of materials (i.e., lighting fixtures or switchgear). The Contractor shall add and sign the following paragraph on equipment and materials submitted for review. "It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into the project; is in compliance with the Contract Drawings and specifications and can be installed in the allocated spaces". Failure to add the above written statement for compliance will result in return of submittals without review.

a. Bind catalog cuts, plate numbers, descriptive bulletins and drawings, 11" x 17" (275 mm x 435 mm) or smaller, in sets with covers neatly showing titles.
b. The Contractor shall verify dimensions of equipment and be satisfied as to Code compliance for fit prior to submitting shop drawings for approval.
c. Where current limiting devices are specified, submit technical data to substantiate adequate protection of equipment cascaded downstream. Submittals shall not be reviewed unless supporting calculations and data are submitted therewith.
d. Include complete catalog information such as construction, ratings, insulation systems, as applicable.
e. For any material specified to meet UL or trade standards, furnish the manufacturers or vendor's certification that the material furnished for the work does in fact equal or exceed such specifications.
f. Reference listings to the specifications' Sections and Article to which each is applicable.
g. Equipment Floor Plans: After approval of material is secured prepare a floor plan of each electrical and communication equipment space, room or yard, drawn to scale at 1/2 inch equals 1 foot and submit for approval in the same manner as for shop drawings. The layout drawings shall be exact scale.

6. Contractor shall prepare coordinated drawings when required by Division 01 or where noted otherwise.

F. Interpretations: The Contractor through the Architect must make Requests for interpretations of drawings and specifications. Any such requests made by equipment manufacturers or suppliers will be referred to the Contractor.

G. Standard of Quality
1. The contract Drawings and Specifications establish the “MINIMUM STANDARD OF QUALITY” each product and/or system must meet to be considered acceptable. Products of other manufactures will be considered if the product and/or system meet or exceed the “MINIMUM STANDARD OF QUALITY” established by this Contract Document.

H. Submit comprehensive material list, shop drawings and complete technical data for the following equipment and materials:
1. General Requirements:
a. Distribution switchboards.
b. Panelboards.
c. Conduits
d. Conductors, include all selected insulation types.
e. Fuses
f. Disconnect switches and Starters.
g. Pullboxes, manholes and handholes.
h. Standard lighting fixtures, specially fabricated fixtures, ballasts and lamps, with samples and sample of standard finish available (where requested).
i. Control devices, standard and special receptacles, switches, outlets and finish device plates.
j. Cabinets for signal systems, special terminals and cabinets. Include all cabinet dimensions.
k. Fire alarm system.
l. Transformers
m. Security System cables, devices and terminations.
n. Public Address System.
o. Data Systems.

I. Utility Service.
   1. Contractor shall verify the locations shown on the drawings and shall include extensions of lines to building service from locations which are acceptable to the Owner.
   2. Verify electrical, civil, architectural and structural, dimensional and other requirements with the Owner.
   3. Should any major modifications to the work indicated be necessary to comply with the Owner requirements, notify the Architect.

J. Record Drawings: Refer to Division 01, Contract Closeout.

K. Work Responsibilities:
   1. The drawings indicate diagrammatically the desired locations or arrangement of conduit runs, outlets, junction boxes and equipment and are to be followed. Execute the work so as to secure the best possible installation in the available space and to overcome local difficulties due to space limitations. The Contractor is responsible for the correct placing of his work. Where conflicts occur in plans and/or specifications, the most stringent application shall apply and shall be part of the base bid.
   2. Locations shown on architectural plan or on wall elevations shall take precedence over electrical plan locations, but where a major conflict is evident, notify the Architect.
   3. In the event minor changes in the indicated locations or arrangement are necessary due to developed conditions in the building construction or rearrangement of furnishings or equipment or due to interference with other trades, such changes shall be made without extra cost.
   4. Verify dimensions and the correct location of Owner-Furnished equipment before proceeding with the roughing-in of connections.
   5. All scaled and figured dimensions are approximate of typical equipment of the class indicated. Before proceeding with work carefully check and verify dimensions and sizes with the drawings to see that the furnished equipment will fit into the spaces provided without violation of applicable Codes.
   6. Should any changes to the work indicated on the drawings or described in the specifications be necessary in order to comply with the above requirements, notify the Architect.
   7. Contractor shall be responsible for coordination of coordinated drawings when required by the Architect.
   8. Replace or repair, without additional compensation any work which does not comply with or which is installed in violation of any of these requirements.

L. Installation General: For special requirements, refer to specific equipment under these requirements.
   1. Unless otherwise specified elsewhere in the specifications, do all excavating necessary for the proper installation of the electrical work.
   2. Locations of Openings: Locate chases, shafts and openings required for the installation of the electrical work during framing of the structure. Do any additional cutting and patching required. Cutting or drilling in any structural member is prohibited without approval of the Architect. Furnish all access panels to make all boxes, connections and devices accessible as required by CEC.
   3. Location of Sleeves: Where conduits pass through concrete walls, suspended slabs or metal deck floors, install sleeves of adequate size to permit installation of conduit. Sleeves shall be installed prior to pouring of concrete and shall have ends flush with the wall or extend 2 inches above floor surfaces. Verify locations.
   4. Type of Sleeves: Refer to Division 26.

5. Wherever conduit extends through roof, install flashings in accordance with drawings and details.
6. Contractor shall be responsible for cutting and patching which may be required for the proper installation of the electrical work.
7. Protect work, materials and equipment cause whatever and provide adequate and proper storage facilities during the progress of the work. Storage outdoors shall be weather protected and shall include space heaters to prevent condensation. Provide for the safety and good condition of all work until final acceptance of the work. Replace all damaged or defective work, materials and equipment before requesting final acceptance.
8. Conduit and Equipment to be Installed: Clean thoroughly to remove plaster, spattered paint, cement and dirt on both exterior and interior. All underground conduits shall be mandrelled prior to pulling wire.
9. Conduit and Equipment to be Painted: Clean conduit exposed to view in completed structure by removing plaster and dirt. Remove grease, oil and similar material from conduit and equipment by wiping with clean rags and suitable solvents in preparation for paint.
10. Items with Factory Finish: Remove cement, plaster, grease and oil, and leave surfaces, including cracks and corners, clean and polished. Touch up scratched or bare spots to match finish.
11. Site Cleaning: Remove from site all packing cartons, scrap materials and other rubbish on a weekly basis. Vacuum out all cabinets, switchgear and panels and junction boxes prior to pulling any conductors.
12. Electrical equipment and materials exposed to public and in finished areas shall be finish-painted after installation in accordance with the Painting Section. All exposed screw-type fasteners, exterior, or interior in restrooms, shall be vandal-resistant spanner type; include tool.

M. Excavation, Cutting and Patching:
1. Excavating, trenching and backfilling required for the work of this Division in accordance with the applicable requirements of Division 31. Excavating and backfilling connected with electrical work, repaving cuts and providing and maintaining protective measures for the electrical work excavation required by the governing authorities having jurisdiction shall be performed as a part of the work of this Division.
2. Verify openings indicated on the drawings. Provide all cutting, patching and reinforcement of the construction of the building as required to install electrical work.

N. Tests
1. Equipment and systems for which the National Electrical Testing Association (NETA) has an approved or recommended procedure, shall be tested in accordance with that procedure. Test values shall equal values recommended by NETA. Copies of test reports shall be submitted as required under shop drawing submittals.
2. Resistance to ground tests shall be accomplished by a qualified independent testing firm to measure resistance to ground at grounding electrodes. Make tests before slabs or affected areas are poured in order that corrective measures, if required, may be taken. Submit a report showing the results of these measurements. If the resistances exceed values specified elsewhere or NETA test procedure recommendations, perform corrective measures required to reduce resistance to acceptable values.
3. Prior to energizing any motor, measure the service voltage for phase balance and report if unbalance exceeds 1% from mean.
4. Measure the three-phase voltage at no load and at maximum load conditions and submit to the engineer a report showing the results of these measurements.

5. Upon completion of the work and adjustment of all equipment, conduct an operating test. Conduct the test in the presence of an authorized representative of the Architect. Demonstrate system and equipment to operate in accordance with requirements of the Contract Documents and to be free from electrical and mechanical defects. Provide systems free from short circuits and grounds and show an insulation resistance between phase conductors and ground not less than the requirements of the governing electric code. Test circuits for proper neutral connection.
6. Complete tests prior to final inspection of project, including corrective work based on the results of the tests.
7. Perform special tests on systems and equipment as specified herein using personnel qualified to perform such tests.

O. Protection: Protect finish parts of the materials and equipment against damage during the progress of the work and until final completion and acceptance. Cover materials and equipment in storage and during construction in such a manner that no finished surfaces will be damaged or marred. Keep moving parts clean, dry and lubricated.

P. Cleaning Up:
1. Upon completion of the work and at various time during the progress of the work, remove from the building all surplus materials, rubbish and debris resulting from the work of this Division.
2. Thoroughly clean switchgear including busses, apparatus, exposed conduit, metal work including the exterior and interior, and accessories for the work of this Division, of cement, plaster and other deleterious materials; remove grease and oil spots with cleaning solvent; carefully wipe surfaces and scrape cracks and corners clean.
3. Thoroughly polish chromium or plated work. Remove dirt and stains from lighting fixtures.
4. Leave the entire installation in a clean condition.

Q. Completion:
1. The work will not be reviewed for final acceptance until operating and maintenance data, manufacturer's literature, panel directories and nameplates specified herein have been approved and properly posted or installed and final cleaning of equipment and premises has been completed.
2. When the installation is complete and adjustments have been made, operate the system for a period of one week, during which time demonstrate that systems are completed and operating in conformance with the specifications.

R. Operating and Maintenance Data: Submit complete and at one time, prior to acceptance of the installation, 4 copies of manufacturer's instructions for operation and maintenance of electrical equipment, including replacement parts lists. As specified in Division 01

S. Inspection and Acceptance Procedures: The Architect will submit observation reports periodically during the construction phase detailing Contract deficiencies. The Contractor is responsible for making corrections immediately. Notice of Completion of the project will not be made until all items have been corrected.

T. Final Completion of Electrical Systems:
1. Prior to Final Completion of operating electrical systems, the Contractor shall:
   a. Provide materials of the type and quality specified and as necessary for proper operation, tested and ready for use.
   b. Deliver to the Architect, the Record Documents per 1.3 of this section.
   c. Furnish the required Operating and Maintenance Data/Manuals.

d. Clean up of the project pertaining to this Division of the work.
e. After installation has been completed and adjustments made, operate the system for a period of one week, during which time, demonstrate to the Architect that systems are complete and operating in conformance with Contract Documents.
f. Conduct tests required and as specified in this Division and submit test reports and corrective actions taken.
g. Submission of warranties and guarantees.

2. Final Completion of Work Shall be Contingent On:
a. Contractor replacing defective materials and workmanship.
b. Upon completion of work and adjustments made, Contractor shall conduct an operating test for each system for approval at such time as Architect directs. Conduct test in presence of authorized representative of Architect and demonstrate that systems and equipment do operate in accordance with requirements of the Contract Documents and are free from electrical and mechanical defects.
c. Contractor shall provide the necessary training programs and instructions to the Owner's representative. Number of hours shall be a minimum of four (4) hours for each system or days as required under separate Sections of these Specifications. Complete operation and maintenance manuals shall be provided at least two (2) weeks prior to training.
d. Submit copies of manufacturer's instructions and maintenance of electrical equipment including replacement parts lists. Each set shall include one set of shop drawings of equipment installed.

U. Submittals for Change Orders: When changes are made during the construction phase, deletions and additions shall be presented in a manner that will indicate the cost of each item of material and corresponding labor. Markup shall be then added in accordance with the requirements of the General Conditions as modified by the Supplementary Conditions.

V. The Contractor at a time convenient to the Owner shall provide instruction to the Owner's operating personnel in the proper operation and maintenance of all equipment and systems. The instructors shall have received factory training and shall be thoroughly familiar with the equipment installed. The operating personnel shall receive the number of days instruction as indicated in other sections.

1.3 PROJECT RECORD DOCUMENTS

A. Record Drawings: CAD: Use a computer aided drafting (CAD) system in the preparation of record drawings for this Project. Acceptable CAD systems shall be capable of producing files in AutoCAD Version 2000 compatible DWG or DXF format. Owner's consultant will furnish CAD backgrounds for use by the Contractor after construction is 90% complete except where prohibited by Contract.

B. At all times when the work is in progress, maintain at the workplace, fabrication shop or Project Site as applies, a complete separate, clean, undamaged set of the latest stamped, actioned submittals. As work progresses, maintain records of "as installed" conditions on this set in suitable ink or chemical fluid. Update the set daily. After successful completion of Project Site testing specified herein, and after completion of Punch List corrections, copy all records of "as installed" conditions on to originals.

C. Quantity:

1. Review sets: As for Shop and Field Drawings.
2. Record set: Three (3) blueline.
   One (1) mylar.

D. Format: Record Drawings:
   1. Pencil, permanent ink or permanent photographic process.
      a. Front face only of Mylar at least 3.0 mils thick.
      b. Appliqué film or lettering prohibited.
      c. Suitable for microfilming. Lettering 1/8" (.8 mm) high minimum.
   2. Disk copy of Record Drawings - 1 copy of each drawing file in format noted above, CD-ROM.

E. Content: All drawings required under "Field and Shop Drawings". Show "as installed" condition. Where room designations according to Project permanent signage differ from construction designations in the Contract Documents, show both designations.

F. Warranty Certificates: Comply with Division 01.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Electrical equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Sleeve seals.
4. Grout.
5. Common electrical installation requirements.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:
1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.
   1. Minimum Metal Thickness:
      a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
      b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE SEALS

A. Retain this article if annular space between pipe sleeves and raceways or cables must be sealed against hydrostatic pressure. Sleeve seals are usually furnished with EPDM sealing elements, plastic pressure plates, and carbon-steel bolts. NBR and silicone sealing elements, carbon- and stainless-steel pressure plates, and stainless-steel bolts are available for special applications.

B. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Advance Products & Systems, Inc.
      b. Calpico, Inc.
      c. Metraflex Co.
      d. Pipeline Seal and Insulator, Inc.
   2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
   3. Pressure Plates: Carbon steel. Include two for each sealing element.
   4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.2 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria is not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
   1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway

and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."

K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Building wire and cable.

B. Wiring connectors and connections.

1.2 REFERENCES

A. ANSI/CEC - National Electrical Code.

B. C.E.C. – California Electrical Code.

C. InterNational Electrical Testing Association.

D. OSHA, Definition B, 29 CFR 1910.7.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of C.E.C.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.5 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.

C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

1.6 COORDINATION

A. Determine required separation between cable and other work.

B. Determine cable routing to avoid interference with other work.

PART 2 - PRODUCTS

2.1 BUILDING WIRE AND CABLE

A. Description: Single conductor insulated wire, new, manufactured not more than 6 months prior to installation, with size, type of insulation, voltage rating and manufacturer's name permanently marked on outer covering at regular intervals.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

3.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.3 WIRING METHOD

A. Type THHN/THWN insulation for dry interior locations, in raceway.

B. Type THWN for exterior or wet locations, in raceway.

3.4 INSTALLATION

A. Provide conductors continuous from outlet to outlet and splice only at outlet or junction boxes.

B. Circuit all feeders and branch circuits as shown on the drawings. Suggested deviation from the plans must be provided by the Architect.

C. Install products in accordance with manufacturers instructions.

D. Use solid conductor for feeders and branch circuits 10 AWG and smaller.

E. Use stranded conductors for control circuits.

F. Use conductor not smaller than 12 AWG for power and lighting circuits.

G. Use conductor not smaller than 16 AWG for control circuits.

H. Low voltage control wiring shall be No. 18 AWG minimum, insulated cable for each conductor. Voltage rating of cable shall be suitable for either Class I or Class II, remote control or signal circuit, as determined by the code and the actual installation.

I. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet (450-m).

J. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet (600-m).

K. Install all conductors in a single raceway at one time, insuring that conductors do not cross one another while being pulled into raceway. Leave sufficient cable at all fittings or boxes and prevent conductor kinks. Keep all conductors within the allowable tension and exceeding the minimum-bending radius.

L. Use suitable wire pulling lubricant for building wire 4 AWG and larger. Lubricants for wire pulling shall conform to UL requirements for the insulation and raceway material.

M. Provide conductor supports as required by Code and recommended by the cable manufacturer. Where required, provide cable supports in vertical conduits similar to OZ Gedney Type CMT and provide the lower end of conduit with OZ Gedney Type KVF ventilators.

N. No splicing or joints will be permitted in either feeder or branch circuits except at outlet or accessible junction boxes.

O. Neatly train and lace wiring inside boxes, equipment, and panelboards.

P. Clean conductor surfaces before installing lugs and connectors.

Q. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise. Keep splices in underground junction boxes, handholes, and manholes to an absolute minimum. Where splices are necessary, use resin pressure splices and resin splicing kits manufactured by the 3M Company to totally encapsulate the splice. Arrange the splicing kit to minimize the effects of moisture.

R. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

S. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

T. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

U. Provide all power and control conductors, that terminate on equipment or terminal strips, with solderless lugs or tork and flanged tongue terminals. Provide T & B "Sta-kon" tongue terminal. This type conductor termination is not required when the equipment is provided with solderless connectors.

3.5 INTERFACE WITH OTHER PRODUCTS

A. Identify wire and cable under provisions of Division 26.

B. Identify each conductor with its circuit number or other designation indicated on Drawings.

C. Conductor Identification: All branch circuit conductors (No. 10 AWG and smaller) throughout the project shall be provided with color-coded insulation as follows:

208Y/120V	Phase	480Y/277
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

D. Conductors No. 8 and larger shall be black with bands of colored nonaging, plastic tape to color code the conductors, utilizing the same scheme as for branch circuits. The bands shall occur within each enclosure where a tap, splice or termination is made.

E. Color code all control wire insulation and label each termination.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

B. Perform tests and inspections and prepare test reports.

C. Tests and Inspections:
1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.
   a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
   b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
   c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

D. Test Reports: Prepare a written report to record the following:
1. Test procedures used.
2. Test results that comply with requirements.

3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

E. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in Part 3 "Field Quality Control" Article, including the following:
   1. Test wells.
   2. Ground rods.
   3. Ground rings.
   4. Grounding arrangements and connections for separately derived systems.
   5. Grounding for sensitive electronic equipment.

C. Qualification Data: For testing agency and testing agency's field supervisor.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For grounding to include the following in emergency, operation, and maintenance manuals:
   1. Instructions for periodic testing and inspection of grounding features at grounding connections for separately derived systems based on NETA MTS and CECB.
      a. Tests shall be to determine if ground resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if they do not.
      b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
   1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with UL 467 for grounding and bonding materials and equipment.

D. Comply with the California Electrical Code.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

D. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
1. Pipe Connectors: Clamp type, sized for pipe.

E. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.2 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; ¾ inch by 10 feet (19 mm by 3 m) in diameter.

B. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.
1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches (1200 mm) long.
2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 4/0 AWG minimum.
   1. Bury at least 24 inches (600 mm) below grade.
   2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus on insulated spacers 1 inch (25 mm), minimum, from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus.

E. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
   3. Connections to Ground Rods at Test Wells: Bolted connectors.
   4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches (100 mm) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches (50 mm) above to 6 inches (150 mm) below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches (150 mm) from the foundation.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits sized per C.E.C. Table 250-122.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by CEC:
   1. Feeders and branch circuits.
   2. Lighting circuits.
   3. Receptacle circuits.
   4. Single-phase motor and appliance branch circuits.
   5. Three-phase motor and appliance branch circuits.
   6. Flexible raceway runs.
   7. Armored and metal-clad cable runs.
   8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
   9. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater: Install a separate insulated equipment grounding conductor to each electric water heater. Bond conductor to heater units, piping, connected equipment, and components.

E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

G. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in ¾" (19mm) raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
   1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
   2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

H. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Common Ground Bonding with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
   2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 26 Section "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches (300 mm) deep, with cover.
   1. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
   3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install [tinned]bonding jumper to bond across flexible duct connections to achieve continuity.

H. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

I. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column and where indicated on the drawings.
1. Install tinned-copper conductor not less than No. 4/0 AWG for ground ring and for taps to building steel.
2. Bury ground ring (where indicated) not less than 24 inches (600 mm) from building foundation.

J. UFER Ground (Concrete-Encased Grounding Electrode): Fabricate according to CEC, using a minimum of 40 feet (12 meters) of bare copper conductor not smaller than No. 4/0 AWG.
1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to grounding electrode external to concrete.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

C. Perform the following tests and inspections and prepare test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
    a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.
3. Prepare dimensioned drawings locating each test well, ground rod and ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

D. Power Report measured ground resistances that exceed the following values:
1. and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohms.

5. Substations and Pad-Mounted Equipment: 5 ohms.
6. Manhole Grounds: 10 ohms.

E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 26 05 29 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

B. Related Sections include the following:
   1. Division 26 Section "Vibration and Seismic Controls For Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of [five] times the applied force.

1.5 SUBMITTALS

A. Product Data: For the following:
   1. Steel slotted support systems.
   2. Nonmetallic slotted support systems.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
   1. Trapeze hangers. Include Product Data for components.
   2. Steel slotted channel systems. Include Product Data for components.
   3. Nonmetallic slotted channel systems. Include Product Data for components.
   4. Equipment supports.

C. Welding certificates.

1.6 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with CEC.

1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. ERICO International Corporation.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut; Tyco International, Ltd.
      g. Wesanco, Inc.
   3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
   4. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
   5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
   6. Channel Dimensions: Selected for applicable load criteria.

B. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch- (14-mm-) diameter holes at a maximum of 8 inches (200 mm) on center, in at least 1 surface.
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. Fabco Plastics Wholesale Limited.
      d. Seasafe, Inc.
   3. Fittings and Accessories: Products of channel and angle manufacturer and designed for use with those items.
   4. Fitting and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.
   5. Rated Strength: Selected to suit applicable load criteria.

C. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

D. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
      a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         1) Hilti Inc.
         2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
         3) MKT Fastening, LLC.
         4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
   2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
      a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Cooper B-Line, Inc.; a division of Cooper Industries.
2) Empire Tool and Manufacturing Co., Inc.
3) Hilti Inc.
4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by CEC. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in CEC.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts or Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete or Cast-in-Place Concrete (Limited Applications)" as applicable.

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturers written instructions.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements in Division 09 for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. ENT: Electrical nonmetallic tubing.

C. EPDM: Ethylene-propylene-diene terpolymer rubber.

D. FMC: Flexible metal conduit.

E. IMC: Intermediate metal conduit.

F. LFMC: Liquidtight flexible metal conduit.

G. LFNC: Liquidtight flexible nonmetallic conduit.

H. NBR: Acrylonitrile-butadiene rubber.

I. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.
   1. Custom enclosures and cabinets.
   2. For handholes and boxes for underground wiring, including the following:
      a. Duct entry provisions, including locations and duct sizes.
      b. Frame and cover design.
      c. Grounding details.
      d. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
      e. Joint details.

C. Samples for Initial Selection: For wireways and surface raceways with factory-applied texture and color finishes.
   1. Size: 12” (300mm).

D. Samples for Verification: For each type of exposed finish required for wireways and surface raceway, prepared on Samples of size indicated below.
   1. Size: 12” (300mm).

E. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
   1. Structural members in the paths of conduit groups with common supports.
   2. HVAC and plumbing items and architectural features in the paths of conduit groups with common supports.

F. Manufacturer Seismic Qualification Certification: Submit certification that enclosures and cabinets and their mounting provisions, including those for internal components, will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
      a. The term "withstand" means "the cabinet or enclosure will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will retain its enclosure characteristics, including its interior accessibility, after the seismic event.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

G. Qualification Data: For professional engineer and testing agency.

H. Source quality-control test reports.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with CEC.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Co.
6. Manhattan/CDT/Cole-Flex.
7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.
9. Wheatland Tube Company.

C. Rigid Steel Conduit: ANSI C80.1.

D. Aluminum Rigid Conduit: ANSI C80.5.

E. IMC: ANSI C80.6.

F. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch (1 mm), minimum.

G. EMT: ANSI C80.3.

H. FMC: Zinc-coated steel.

I. LFMC: Flexible steel conduit with PVC jacket.

J. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
2. Fittings for EMT: Steel, raintight compression with integral insulated throat.
3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

K. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.2 NONMETALLIC CONDUIT AND TUBING

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corporation.
4. CANTEX Inc.
5. CertainTeed Corp.; Pipe & Plastics Group.
6. Condux International, Inc.
7. ElecSYS, Inc.

8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; a Hubbell Company.
12. Thomas & Betts Corporation.

C. NEMA TC 13.

D. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

E. LFNC: UL 1660.

F. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.

G. Fittings for LFNC: UL 514B.

2.3 OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY AND FITTINGS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Arnco Corporation.
2. Endot Industries Inc.
3. IPEX Inc.
4. Lamson & Sessions; Carlon Electrical Products.

C. Description: Comply with UL 2024; flexible type, approved for riser installation.

2.4 METAL WIREWAYS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper B-Line, Inc.
2. Hoffman.
3. Square D; Schneider Electric.

C. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1 or 3R, unless otherwise indicated on drawings or as required for specific installation.

D. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

E. Wireway Covers: Screw-cover type or Flanged-and-gasketed type for specific installation to maintain NEMA rating.

F. Finish: Manufacturer's standard enamel finish.

2.5 NONMETALLIC WIREWAYS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Hoffman.
2. Lamson & Sessions; Carlon Electrical Products.
3. Or approved equal.

C. Description: Fiberglass polyester, extruded and fabricated to size and shape indicated, with no holes or knockouts. Cover is gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections are flanged, with stainless-steel screws and oil-resistant gaskets.

D. Description: PVC plastic, extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections with plastic fasteners.

E. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

2.6 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Manufacturer's standard enamel finish in color selected by Architect in areas not exposed to public view or Prime coating, ready for field painting where exposed to public view.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Thomas & Betts Corporation.
b. Walker Systems, Inc.; Wiremold Company (The).
c. Wiremold Company (The); Electrical Sales Division.

B. Surface Nonmetallic Raceways: Not permitted on project.

2.7 BOXES, ENCLOSURES, AND CABINETS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Erickson Electrical Equipment Company.
4. Hoffman.
5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
6. O-Z/Gedney; a unit of General Signal.
7. RACO; a Hubbell Company.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet Division.
10. Spring City Electrical Manufacturing Company.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

C. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

D. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: NEMA OS 2.

F. Metal Floor Boxes: Cast or sheet metal, semi-adjustable, rectangular.

G. Nonmetallic Floor Boxes: Not permitted on project.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

J. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

K. Cabinets:
1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

2.8 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Description: Comply with SCTE 77.
1. Color of Frame and Cover: Gray.
2. Configuration: Units shall be designed for flush burial and have integral closed bottom, unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.

4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering, as indicated for each service.
6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
7. Handholes 12 inches wide by 24 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or a combination of the two.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
3. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
   a. Armorcast Products Company.
   b. Carson Industries LLC.
   c. CDR Systems Corporation.
   d. NewBasis.
   e. Brooks.

C. Fiberglass Handholes and Boxes with Polymer-Concrete Frame and Cover: Sheet-molded, fiberglass-reinforced, polyester-resin enclosure joined to polymer-concrete top ring or frame.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
3. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings.

D. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with covers of reinforced concrete.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
3. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings.

2.9 SLEEVES FOR RACEWAYS

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052- or 0.138-inch (1.3- or 3.5-mm) thickness as indicated and of length to suit application.

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

2.10 SLEEVE SEALS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
1. Advance Products & Systems, Inc.
2. Calpico, Inc.
3. Metraflex Co.
4. Pipeline Seal and Insulator, Inc.

D. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.
1. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
2. Pressure Plates: Carbon steel. Include two for each sealing element.
3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.11 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
1. Tests of materials shall be performed by a independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
1. Exposed Conduit: Rigid steel conduit or IMC.
2. Concealed Conduit, Aboveground: EMT.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.

4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
6. Application of Handholes and Boxes for Underground Wiring:
   a. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Traffic rated steel.
   b. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Traffic rated steel.
   c. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Traffic rated steel.

B. Comply with the following indoor applications, unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Physical Damage: IMC. Includes but not limited to, raceways in the following locations:
   a. Shop Areas.
   b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
   c. Mechanical rooms.
   d. Kitchen Areas.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Damp or Wet Locations: IMC.
7. Raceways for Optical Fiber or Communications Cable in Spaces Used for Environmental Air: EMT unless otherwise noted on drawings.
8. Raceways for Optical Fiber or Communications Cable Risers in Vertical Shafts: EMT.
9. Raceways for Concealed General Purpose Distribution of Optical Fiber or Communications Cable: EMT.
10. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.

C. Minimum Raceway Size: 3/4-inch (19-mm) trade size for above ground and 1 inch (32mm) trade size for below grade.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

E. nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits in contact with concrete.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."

E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

H. Raceways Embedded in Slabs:
1. Not Allowed
2. Change from RNC, Type EPC-40-PVC to PVC coated rigid steel conduit, or IMC before rising above the floor through slab.

I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

L. Raceways for Optical Fiber and Communications Cable: Install raceways, metallic and nonmetallic, rigid and flexible, as follows:
1. 1-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23 m).
2. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

M. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by CEC.

N. Expansion-Joint Fittings for RNC: Not permitted on project.

O. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

P. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

Q. Set metal floor boxes level and flush with finished floor surface.

R. Set metallic floor boxes level. Trim after installation to fit flush with finished floor surface.

S. Coordinate with Architectural drawings for tackable wallboards and install box rings so that no space exists between device and wall plate.

T. No non-metallic conduit is allowed above grade.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Install top of duct bank minimum 24 inches (600mm) below finished grade. Adjust depth to avoid interference with gravity flow systems of any kind. Maintain minimum 12 inches (300mm) clearance between duct bank and any gravity flow system.

B. Duct lines shall have a continuous slope downward toward manholes and away from buildings with a pitch of not less than 4 inches (100mm) in 100 feet (300m). Changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet (50m), except that manufactured bends may be used at ends of short runs of 100 feet (300mm) or less, and then only at or close to the end of run.

C. Terminate conduit in end bell at manhole and pullbox entries.

D. Use suitable separators and chairs installed not greater than 4 feet (25m) on centers. Band conduit together with suitable banding devices. Securely anchor conduit to prevent movement during concrete or slurry placement.

E. Provide minimum 3 inches (75mm) concrete 2 sack slurry cover at bottom, top, and sides of duct bank. Refer to Division 3 section for additional information.

F. Provide two No. 4 steel reinforcing bars in top of bank under paved driving areas.

G. Encase non-metallic primary and secondary feeders, telephone, fire alarm communications and data conduit installed underground 2 inches (50-mm) or larger in a concrete or slurry duct bank unless noted otherwise in the Contract Documents. Space the external surfaces of conduit within a bank a minimum of 3 inches (75-mm) apart except that sound, telephone, data and intercommunication circuits contained within non-metallic conduit shall have a minimum separation of 12 inches (300-mm) from any light or power circuits that parallel them within a bank. Use appropriate manufactured plastic spacers to insure the minimum required concrete or slurry coverage. All concrete or slurry duct conduit banks shall contain a warning tape 12 inches (300-mm) above ductbank.

H. Numbers and sizes of ducts shall be as indicated. Depending on the contour of the finished grade, the high-point may be at a terminal, a manhole, a handhole, or between manholes or handholes. Manufactured steel 90-degree duct bends shall be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 18 inches (450-mm) for ducts of less than 3-inch (75-mm) diameter, and 36 inches (900-mm) for ducts 3 inches (75mm) in diameter 48 inches (1.2-m) for ducts or greater in diameter unless noted otherwise in the Contract Documents. Long sweep bends having a minimum radius of 25 feet (75-m) shall be used for a change of direction of more than 5 degrees, horizontally or vertically. Both curved and straight sections shall be used to form long sweep bends as required, but the maximum curve used shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells whenever duct lines terminate in manholes, pullboxes or handholes. Duct line markers shall be provided at the ends of long duct line stubouts or for other ducts whose locations are indeterminate because of duct curvature or terminations at completely below-grade structures. In lieu of markers, a 5-mil brightly colored plastic tape not less than 3 inches (75-mm)in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion resistant 1-mil metallic foil core to permit easy location of the duct line, shall be placed approximately 12 inches (300mm) below finished grade levels of such lines.

I. Ducts shall be kept clean of concrete or slurry, dirt or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. After a duct line is completed, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrels shall be at least 12 inches (300-mm) long and have diameters 1/4 inch (6.2-mm) less than the inside diameter of the duct being cleaned. Pneumatic rodding may be used to draw in lead wires. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade in unpaved areas.

D. Install handholes and boxes with bottom depth as required to meet elevation of incoming conduits.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Penetration Firestopping."

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Rectangular Sleeve Minimum Metal Thickness:
1. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side greater than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches (1270 mm) and 1 or more sides equal to, or greater than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

E. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

F. Cut sleeves to length for mounting flush with both surfaces of walls.

G. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

H. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway unless sleeve seal is to be installed or unless seismic criteria require different clearance.

I. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.

J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.

K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway penetrations. Install sleeves and seal with firestop materials. Comply with Division 07 Section "Penetration Firestopping."

L. Roof-Penetration Sleeves: Seal penetration of individual raceways with flexible, boot-type flashing units applied in coordination with roofing work.

M. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

N. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway and sleeve for installing mechanical sleeve seals.

3.6 SLEEVE-SEAL INSTALLATION

A. Install to seal underground, exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Penetration Firestopping."

3.8 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 05 48 – VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Isolation pads.
2. Spring isolators.
3. Restrained spring isolators.
4. Channel support systems.
5. Restraint cables.
6. Hanger rod stiffeners.
7. Anchorage bushings and washers.

B. Related Sections include the following:
1. Division 26 Section "Hangers And Supports For Electrical Systems" for commonly used electrical supports and installation requirements.

1.3 DEFINITIONS

A. The IBC: International Building Code.

B. ICC-ES: ICC-Evaluation Service.

C. OSHPD: Office of Statewide Health Planning and Development for the State of California.

D. CEC: California Electrical Code.

E. CBC: California Building Code.

1.4 PERFORMANCE REQUIREMENTS

A. Seismic-Restraint Loading:
1. Electrical equipment shall be seismically anchored to conform to C.C.R. Title 24, 2019 CBC Section 1615A.1.12 through 1615A.1.22, Anchorage details not shown on the approved plans or otherwise approved by DSA are subject to field approval by the Architect and/or Structural Engineer of record and field approval by DSA. All conduits shall be supported and braced in accordance with SMACNA Guidelines, the CEC and as approved by DSA.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.

B. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.

C. Welding certificates.

D. Qualification Data: For Testing Agency.

E. Field quality-control test reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the CBC unless requirements in this Section are more stringent.

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

E. Comply with CEC.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
1. Ace Mountings Co., Inc.
2. Amber/Booth Company, Inc.
3. California Dynamics Corporation.
4. Isolation Technology, Inc.
5. Kinetics Noise Control.
6. Mason Industries.
7. Vibration Eliminator Co., Inc.
8. Vibration Isolation.
9. Vibration Mountings & Controls, Inc.

D. Pads : Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment. Refer to drawing details for locations.
1. Resilient Material: Oil- and water-resistant neoprene.

2.2 SEISMIC-RESTRAINT DEVICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
1. Amber/Booth Company, Inc.
2. California Dynamics Corporation.
3. Cooper B-Line, Inc.; a division of Cooper Industries.
4. Hilti Inc.
5. Loos & Co.; Seismic Earthquake Division.
6. Mason Industries.
7. TOLCO Incorporated; a brand of NIBCO INC.
8. Unistrut; Tyco International, Ltd.

D. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency acceptable to DSA.
1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least 4 times the maximum seismic forces to which they will be subjected.

E. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.

F. Restraint Cables: ASTM A 603 galvanized steel cables in concealed spaces and ASTM A 492 stainless-steel cables in areas exposed to view in public spaces. Both shall have end connections made of steel assemblies with thimbles, brackets, swivels, and bolts

designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

G. Hanger Rod Stiffener: Reinforcing steel angle clamped to hanger rod. Do not weld stiffeners to rods.

H. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.

I. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.

J. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

K. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.

L. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.3 FACTORY FINISHES

A. Finish: Manufacturer's standard prime-coat finish ready for field painting.

B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
1. Powder coating on springs and housings.
2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
3. Baked enamel or powder coat for metal components on isolators for interior use.
4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to DSA.

B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Equipment and Hanger Restraints:
1. Install restrained isolators on electrical equipment.
2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
3. Install seismic-restraint devices using methods approved by DSA.

B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

D. Drilled-in Anchors:
1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

B. Tests and Inspections:
1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. Measure isolator restraint clearance.
7. Measure isolator deflection.
8. Verify snubber minimum clearances.
9. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

3.6 ADJUSTING

A. Adjust isolators after isolated equipment is at operating weight.

B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

C. Adjust active height of spring isolators.

D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Nameplates.

B. Wire and cable markers.

1.2 SUBMITTALS

A. Submit shop drawings under provisions of Division 01.

B. Include schedule for nameplates and tape labels.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Nameplates: Engraved three-layer laminated plastic, white letters on a white black background.

B. Wire and Cable Markers: Cloth markers, split sleeve or tubing type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Degrease and clean surfaces to receive nameplates.

B. Install nameplates and tape labels parallel to equipment lines.

C. Secure nameplates to equipment fronts using screws, or rivets. Secure nameplate to inside face of recessed panelboard doors in finished locations.

D. Embossed tape will not be permitted for any application.

3.2 WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with panel and branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams equipment manufacturer's shop drawings for control wiring.

3.3 NAMEPLATE ENGRAVING

A. Provide nameplates to identify all circuits in the service distribution and power distribution panelboards; branch circuit panelboards; separately mounted starting switches; disconnecting switches; motor control push-button stations; selector switches; terminal cabinets; telephone cabinets, etc. Clearly identify on the nameplate the equipment such as "Air Handling Unit AH-1" and "Hot Water Cir. Pump P-1" in lieu of abbreviated plan references such as "AH-1" or "P-1".

B. Provide nameplates of minimum letter height as scheduled below.

C. Panelboards and Switchboards: 1/4 inch; identify equipment designation, voltage rating, and source.

D. Individual Circuit Breakers In Panelboards and Switchboards: 1/8 inch; identify circuit and load served, including location.

E. Individual Circuit Breakers, Enclosed Switches and Motor Starters: 1/8 inch; identify voltage rating, ampere rating and load served including location.

F. HVAC and Plumbing Control Equipment: 1/8 inch; identify equipment designation and equipment served including location.

G. Communication Terminal Cabinets: 1/4 inch; identify cabinet designation and type of system.

END OF SECTION

SECTION 26 05 72 – ACCEPTANCE TESTING

PART 1- GENERAL

1.1 IT IS THE INTENT OF THESE ACCEPTANCE TESTS TO ASSURE THAT ALL CONTRACTOR SUPPLIED EQUIPMENT IS OPERATIONAL AND WITHIN INDUSTRY AND MANUFACTURER'S TOLERANCES AND IS INSTALLED IN ACCORDANCE WITH DESIGNED SPECIFICATIONS.

A. The acceptance tests and inspections shall determine suitability for energization of switchgear and cables.

B. Items that shall be checked, inspected, and tested include, but are not limited to, the following:
1. Relays.
2. Power/Lighting panelboards.
3. 600V rated cable.
4. Lighting System

1.2 APPLICABLE CODES

A. All inspections and tests shall be in accordance with the following applicable codes and standards except as provided otherwise herein.
1. California Electrical Code - CEC 2016 Edition.
2. National Electrical Manufacturer's Association - NEMA.
3. American Society for Testing and Materials - ASTM.
4. Institute of Electrical and Electronic Engineers - IEEE.
5. National Electrical Testing Association - NETA.
6. American National Standards Institute - ANSI:
   a. C2, National Electrical Safety Code
   b. Z244-1, American National Standard for Personnel Protection
7. State Codes and Ordinances.
8. Insulated Cable Engineers Association - ICEA.
9. Association of Edison Illuminating Companies - AEIC.
   1. Occupational Safety and Health Administration:
   a. Part 1910, Subpart S, 1910.308
   b. Part 1926, Subpart V, 1926.950 through 1926.960
2. National Fire Protection Association - NFPA:
   a. ANSI/CECB, Electrical Equipment Maintenance
   b. CECE, Electrical Safety Requirements for Employee Workplaces
   c. ANSI/CEC, National Electrical Code 2008 Edition
   d. ANSI/NFPA 78, Lightning Protection Code
   e. ANSI/NFPA 101, Life Safety Code
   f. 2016 Title 24 Energy Guidelines, Chapter 8
3. All inspections and tests shall utilize the following references:
   a. Project Design Specification.
   b. Project Design Drawings.
   c. Manufacturer's instruction manuals applicable to each particular apparatus.

1.3 QUALIFICATIONS OF TESTING AGENCY

A. The testing firm shall be an independent testing organization, which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing firm.

B. The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems.

C. The testing firm and all the testing personnel shall have been engaged in such practices for a minimum of ten years.

D. The testing firm shall meet federal OSHA criteria for accreditation of testing laboratories, Title 29, Parts 1907, 1910, and 1936. Full membership in the National Electrical Testing Association constitutes proof of such criteria.

E. The lead, on site, technical person shall be currently certified by the National Electrical Testing Associate (NETA) in Electrical Power Distribution System Testing.

F. Testing firm shall utilize only full-time technicians who are regularly employed by the firm for testing services. Electrically unskilled employees are not permitted to perform testing or assistance of any kind. Electricians may assist, but may not perform testing and/or inspection services.

G. The testing firm shall submit proof of the above qualifications.

H. The testing firm shall be an independent organization as defined by OSHA Title 29, Part 1936 and the National Electrical Testing Association.

I. All instruments used by the testing firm to evaluate electrical performance shall meet NETA's Specifications for Test Instruments. (See Section 1.7 of this specification).

J. The terms used herewith such as Test Agency, Testing Laboratory, or Contractor Test Company, shall be construed to mean testing firm.

1.4 RESPONSIBILITIES

A. The Contractor shall notify the Owners Representative prior to commencement of any testing.

B. Any system, material or workmanship, which is found defective on the basis of acceptance tests, shall be reported.

C. The testing firm shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report.

D. A stable source of 60 hertz power shall be provided for testing purposes by the Contractor. Owners Representative shall witness all tests and a minimum of 14 days notice shall be provided.

1.5 TEST EQUIPMENT

A. Test Instrument Calibration
1. The testing firm shall have a calibration program that assures that all applicable test instrumentation is maintained within rated accuracy.
2. The accuracy shall be directly traceable to the National Bureau of Standards.

3. Instruments shall be calibrated in accordance with the following frequency schedule:
   a. Field instruments: Analog - 6 months maximum
      Digital - 12 months maximum
   b. Laboratory Instruments – 2 months
      Leased specialty equipment - 12 months (where accuracy is guaranteed by lessor)
4. Dated calibration labels shall be visible on all test equipment.
5. Records must be kept up-to-date which show date and results of instruments calibrated or tested.
6. An up-to-date instrument calibration instruction and procedure will be maintained for each test instrument.
7. Calibrating standard shall be of higher accuracy than that of the instrument tested.

1.6 TEST REPORTS

A. The test report shall include the following:
   1. Summary of project.
   2. Description of equipment/device tested.
   3. Description of test, including date, time, and duration of test.
   4. Test results.
   5. Conclusions and recommendations.
   6. Appendix, including appropriate test forms.
   7. Identification of test equipment used.
   8. Signature of responsible test organization authority.
   9. Signature of the person witnessing the tests.
   10. Furnish five copies of the complete report to the Owners Representative no later than thirty (30) days after completion of project unless otherwise directed.

1.7 SAFETY AND PRECAUTIONS

A. Safety practices shall include, but are not limited to, the following requirements:
   1. Occupational Safety and Health Act of 1970 - OSHA.
   2. Accident Prevention Manual for Industrial Operations, National Safety Council, Chapter 4.
   3. Applicable State safety operating procedures.
   4. NETA Safety/Accident Prevention Program.
   5. District’s safety practices.
   6. National Fire Protection Association - CECE.
   7. ANSI Z244.1 American National Standards for Personnel Protection.

B. All tests shall be performed with apparatus de-energized except where otherwise specifically required.

C. The testing firm shall have a designated safety representative on the project to supervise operations with respect to safety.

PART 2- PROTECTIVE DEVICE COORDINATION STUDY

2.1 GENERAL

A. A protective coordination study shall be performed using SKM’s Dapper or equal software to select or check the selection of power fuse ratings, protective relay characteristics and settings, ratios, and characteristics of associated voltage breaker trip characteristics and settings.

B. The coordination study shall include all voltage classes of equipment indicated on the single line diagram drawings. The entire electrical system shall be included in the coordination study. Verify characteristics and settings of existing devices in the field and from the manufacturer.

C. The time-current characteristics of the specified protective devices shall be plotted on the appropriate log-log paper. The plots shall include complete titles, representative one-line diagrams of both buildings and legends, associated relays or fuse characteristics, significant motor starting characteristics, complete parameters of transformers, complete operating bands of low voltage circuit breaker trip curves, and fuse curves. The coordination plots shall indicate the types of protective devices selected, proposed relay taps, time dial and instantaneous trip settings, cable damage curves, symmetrical and asymmetrical fault currents. All requirements of the current California Electrical Code shall be adhered to. Reasonable coordination intervals and separation of characteristic curves shall be maintained. Separate coordination plots for phase and ground protective devices shall be provided on a system basis. Separate curves shall be used to clearly indicate the coordination achieved for feeder breakers with downstream fuses and circuit breakers in switchgear and substations. There shall be a maximum of six protective devices per plot.

D. The selection and setting of the protective devices shall be provided separately in a tabulated form listing circuit identification, IEEE device number, current transformer ratios, manufacturer, type, range of adjustment, and recommended settings. Discrepancies, problem areas, or inadequacies shall be promptly brought to the project Owners Representative’s attention.

E. Five copies of coordination curves and tabulated data indicating selection and settings of protective devices shall be submitted to the Owners Representative for approval.

PART 3 - EQUIPMENT VERIFICATIONS, TESTS AND CALIBRATIONS

3.1 GENERAL

A. As part of the contract, the Contractor shall perform tests of installed work as herein specified and specified in other Sections of these Specifications.

B. The Contractor shall provide all materials, equipment, labor and technical supervision to perform such tests and inspections.

C. All tests shall be performed in compliance with the recommendations and requirements of the National Electrical Testing Association, Inc. (NETA), and applicable codes and standards.

D. Upon completion of the tests and inspections noted in these Specifications, a label shall be attached to all serviced devices. These labels shall indicate date serviced and the service company responsible.

F. The test and inspections shall determine suitability for continued reliable operation.

G. All tests shall be conducted in the presence of the Owners Representative. Provide a minimum of two weeks notice to the Owners Representative.

H. Furnish the necessary equipment and personnel to perform all required tests of all wiring and connections for continuity, short circuit, and improper grounds. Included, but not limited to, the following systems: substations, air interrupting switches, low voltage main and feeder circuit breakers, interlocking controls, panelboards, distribution transformers, branch circuits.

3.2 SWITCHGEAR, SUBSTATIONS, DISTRIBUTION BOARDS, AND EMERGENCY SYSTEM-GENERAL

A. Visual and mechanical inspection:
1. Inspect for physical damage and code violations.
2. Clean interior and exterior surfaces.
3. Inspect for proper alignment, anchorage, and grounding.
4. Check tightness of accessible bolted bus joints by torque wrench method. Tighten connections in accordance with industry standard torque levels.
5. Make closure attempt on locked open devices. Make opening attempt on locked closed devices.
6. Make exchange with devices operated in off-normal positions.

B. Electrical tests:
1. Measure insulation resistance of each bus section phase-to-phase and phase-to-ground.
2. Inspect all accessible bus joints and cable connections by infrared scanner to detect loose or high-resistance connections and other circuit anomalies.
3. Inspect correctness of control wiring.

3.3 BATTERY SYSTEM

A. Visual and mechanical inspection:
1. Inspect for physical damage, anchorage, electrolyte leakage and level.
2. Check intercell bus link and cable connection integrity for tightness and corrosion.

B. Electrical tests:
1. Measure system charging voltage and each individual cell voltage.
2. Measure electrolyte specific gravity.
3. Perform infrared scan of the intracell links cable connections under current discharge conditions.

3.4 INSTRUMENT TRANSFORMER

A. Visual and mechanical inspection:
1. Inspect for physical damage and connection tightness.
2. Check transformer nameplate with singleline diagram.
3. Check proper operation of grounding or shorting devices.

B. Electrical tests:
1. Measure current transformer ratio by primary current injection.
2. Measure potential transformer ratio.
3. Measure insulation resistance primary-to-ground, secondary-to-ground and primary-to-secondary.
4. Verify secondary wiring connections by secondary current injection.
5. Verify transformer polarity markings.
6. Perform current transformer saturation test. Plot transformer voltage current curve.

3.5 CONTROL POWER TRANSFORMERS - ENCAPSULATED TYPE

A. Visual and mechanical inspection:
1. Inspect for physical damage, proper installation, anchorage, and grounding.
2. Clean interior and all bushing and insulator surfaces.
3. Verify proper auxiliary device operation such as fans and indicators.

4. Check tightness of accessible bolted electrical joints. Tighten connections in accordance with industry standards.

B. Electrical tests:
1. Perform insulation resistance tests winding-to-winding and winding-to- ground. Apply appropriate guard circuit over all bushings.
2. Perform dielectric absorption test winding-to-winding and winding-to ground for ten (10) minutes. Compute the polarization index.
3. Perform turns ratio test between windings for all top positions.
4. Perform insulation power factor tests on all high and low-voltage windings.
5. Check output voltages.

3.6 PROTECTIVE RELAYS

A. Visual and mechanical inspection:
1. Inspect relays for physical damage, presence of foreign material, moisture, condition of spiral spring, disc clearance and corrosion.
2. Clean cover glass interior and relay components.
3. Check for freedom of movement, proper travel and alignment, and tightness of mounting hardware and top screws.

B. Electrical test:
1. Perform insulation resistance tests on each circuit branch to frame.
2. Perform the following tests at the settings specified by Owners Representative:
a Pickup parameters on each operating element.
b. Timing at three (3) points on time dial curve.
c. Pickup target and seal in units.
d. Special test as required to check operation of restraint, and other elements per manufacturer's instructions.
3. Perform phase angle and magnitude contribution tests on all differential type relays after energization to vectorially prove proper polarity and connection.
4. Check polarity and correctness of control wiring.

C. Relay calibration and tests:
1. Two relay wiring tests shall be made.
a. Primary circuit polarity test shall include a DC test from the current transformer to each terminal block and relay terminal.
b. Relay and circuit breaker operation test by application of power from the portable relay test set.

D. Relay testing shall be accomplished after completion of the switchgear installation, using standard portable test set equipment and the relay manufacturer's testing directions and parameters to determine conformance of the relay to the time-overcurrent information given in the manufacturer's performance curves and the tap settings provided by coordination study. Overcurrent relay testing shall include:
1. Zero set tests.
2. Pickup tests.
3. Time-current characteristic (operation at currents 3 and 4 times the directed tap settings), and instantaneous at the directed tap setting.
4. Target and seal-in operation.

E. Target differential relays shall be tested similarly, except for the following additional tests:
1. Low voltage “through-currents” of approximately “full load” and “fault” magnitudes shall be circulated in HV busses. Bus differential relays shall not trip.
2. Low voltage currents shall be circulated within the differential zones of “low-fault” and “high-fault” magnitudes. Bus differential relays shall initiate tripping momentarily.

3.7 LOW VOLTAGE CIRCUIT BREAKERS

A. Visual and mechanical inspection:
1. Inspect for physical condition.
2. Inspect alignment and grounding.
3. Perform mechanical operator and contact alignment tests on the breaker and its operating mechanism in accordance with manufacturer’s instructions.
4. Perform insulation resistance test on control wiring.
5. Clean mechanism, insulating surfaces and contacts.

B. Electrical tests:
1. Measure contact resistance.
2. Trip overcurrent protective device by operation of each protective device.
3. Perform an insulation resistance test phase-to-ground, phase-to-phase and across open contacts.
4. Perform insulation resistance test in accordance with Doble procedure.
5. Perform timing test with Travel Analyzer to insure proper contact overtravel and pressure.

3.8 CABLES, LOW VOLTAGE (600 VOLTS AND LESS)

A. Visual and mechanical inspections:
1. Inspect cables for physical damage and proper connection.
2. Torque test cable connection. Tighten connections in accordance with industry standards.
3. Perform infrared scan of all connections under loaded conditions.

B. Electrical tests:
1. Perform insulation resistance test of each cable with respect to ground and adjacent cables.

3.9 GROUNDING SYSTEMS

A. Visual and mechanical inspection:
1. Inspect ground system connections for completeness and adequacy.

B. Electrical tests:
1. Perform fall-of-the-potential test per IEEE No. 81, Section 9.03 to determine the ground resistance between the main grounding system and all major electrical equipment frames, system neutral and/or derived neutral points.

C. INFRARED INSPECTION
1. All doors and cover shall be removed and upon completion of test be reinstalled by testing agency technicians.
2. A load bank shall be furnished to circulate low voltage currents of 400A magnitude through each bus, main breaker and feeder breaker. After two hours infrared scans

shall be made of all bus joints. Problem area shall be photographed before and after corrections. After corrections, another current test of two hours duration shall be made. Again an infrared scan shall be made to confirm correct operation.

3. Upon completion, the switchgear shall be energized at 12kv. After 4 hours, infrared scans shall be made to determine areas of excessive corona. Problem area shall be treated the same as under b., above.
4. Upon completion of infrared scans, all covers and doors shall be reinstalled.

END OF SECTION

SECTION 26 27 26 – WIRING DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Wall switches.

B. Receptacles.

C. Device plates and decorative box covers.

D. Time switches.

1.2 REFERENCES

A. NEMA WD 1 - General-Purpose Wiring Devices.

B. NEMA WD 6 - Wiring Device Configurations.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

A. Single Pole Switch:
   1. Hubbell, Model 2121-I.
   2. Leviton, Model 5621-2I.
   3. Equal by Cooper.

B. Double Pole Switch:
   1. Hubbell, Model 2122-I.
   2. Leviton, Model 5622-2I.
   3. Equal by Cooper.

C. Three-way Switch:
   1. Hubbell, Model 2123-I.
   2. Leviton, Model 5623-3I.
   3. Equal by Cooper.

D. Substitutions: Under provisions of Division 01.

E. Description: NEMA WD 1, heavy-duty specification grade, AC only general-use quiet type rocker switch, UL approved for tungsten lamp loads or inductive loads without derating.

F. Device Body: Ivory plastic with rocker handle.

G. Ratings: 20A., 120-277V A.C. or as required to match with specific branch circuit and load characteristics.

H. Lock type switches shall be Hubbell #1221L.

2.2 RECEPTACLES

A. Duplex Convenience Receptacle:
1. Hubbell
2. Leviton
3. Cooper

B. GFCI Receptacle:
1. Hubbell
2. Leviton
3. Cooper.

C. Surge Protected Outlets:
1. Hubbell
2. Leviton
3. Appleton
4. Pass Seymour

D. Substitutions: Under provisions of Division 01.

E. Description: NEMA WD 1; heavy-duty general-use receptacle. 20 Amp, 125V, 2-pole, 3-wire style line series.

F. Device Body: Plastic.

G. Configuration: NEMA WD 6; type as specified and indicated.

H. Convenience Receptacle: Type 5-20R

I. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.3 WALL PLATES

A. Plates shall be smooth stainless steel with beveled edges and supplied for every local switch, receptacle, telephone and data outlet, wall speaker outlet, etc.

B. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device cover.

C. Locking Weatherproof Cover Plate: Pass & Seymour #WP26-L or equal at locations Indicated on drawings.

D. Plates shall be engraved and filled, when used for:
1. More than two gangs.
2. Equipment that cannot be seen from the locations.

3. All lock type switches.
4. All receptacles other than 120 volts.
5. All pilot switches.
6. Switches in locations from which the equipment or circuits controlled cannot be readily seen.
7. Manual motor starting switches.
8. Where so indicated on the drawings.
9. As required on all control circuit switches, such as heater controls, etc.

2.4 TIME SWITCHES

A. Manufacturers:
1. Tork.
2. Paragon.
3. Intermatic.

B. Description: AC electronic time clock, 7 day.

C. Input voltage: 120V.

D. Poles: 40A, 120V, number as indicated. (4 pole minimum)

E. Enclosure: Type as required to meet installation.

F. Configuration: 365 Day Astronomic, electronic, programmable.

G. Accessories: Photocell control as indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify outlet boxes are installed at proper height.

B. Verify wall openings are neatly cut and will be completely covered by wall plates.

C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install receptacles with grounding pole on top

E. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

F. Install decorative plates on switches, receptacles, etc., and blank outlets in finished areas.

G. Connect wiring devices by wrapping conductor around screw terminal.

H. Use jumbo size plates for outlets installed in masonry walls.

I. Install galvanized steel plates on outlet boxes and junction boxes in unfinished area, above accessible ceilings, and on surface mounted outlets.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Division 26 to obtain mounting heights specified and indicated on drawings.

B. Install wall switches as indicated on drawings.

C. Install convenience receptacles 18 inches above finished floor.

D. Install convenience receptacle 6 inches above backsplash of counter.

3.5 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

END OF SECTION

SECTION 26 51 19 - LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following types of LED luminaires:
1. Cylinder.
2. Downlight.
3. Highbay, linear.
4. Linear industrial.
5. Lowbay.
6. Recessed linear.
7. Strip light.
8. Surface mount, linear.
9. Surface mount, nonlinear.
10. Suspended, linear.
11. Suspended, nonlinear.
12. Materials.
13. Finishes.
14. Luminaire support.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. LED: Light-emitting diode.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaires.

4. Include emergency lighting units, including batteries and chargers.
5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
6. Photometric data and adjustment factors based on laboratory tests[, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project IES LM-79 and IES LM-80.
   a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
   b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

B. Shop Drawings: For nonstandard or custom luminaires.
   1. Include plans, elevations, sections, and mounting and attachment details.
   2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include diagrams for power, signal, and control wiring.

C. Samples: For each luminaire and for each color and texture with standard factory-applied finish.

D. Samples for Initial Selection: For each type of luminaire with custom factory-applied finishes.
   1. Include Samples of luminaires and accessories involving color and finish selection.

E. Samples for Verification: For each type of luminaire.
   1. Include Samples of luminaires and accessories to verify finish selection.

F. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Luminaires.
   2. Suspended ceiling components.
   3. Partitions and millwork that penetrate the ceiling or extend to within 12 inches of the plane of the luminaires.
   4. Structural members to which equipment and or luminaires will be attached.
   5. Initial access modules for acoustical tile, including size and locations.
   6. Items penetrating finished ceiling, including the following:
      a. Other luminaires.
      b. Air outlets and inlets.
      c. Speakers.
      d. Sprinklers.
      e. Access panels.
      f. Ceiling-mounted projectors.
      7. Moldings.

B. Qualification Data: For testing laboratory providing photometric data for luminaires.

C. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

D. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

E. Product Certificates: For each type of luminaire.

F. Product Test Reports: For each luminaire, for tests performed by a qualified testing agency.

G. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.
   1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
   2. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products, and complying with the applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Mockups: For interior luminaires in room or module mockups, complete with power and control connections.
   1. Obtain Architect's approval of luminaires in mockups before starting installations.
   2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.10 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Standards:
1. ENERGY STAR certified.
2. California Title 24 compliant.
3. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
4. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
5. UL Listing: Listed for damp location.
6. Recessed luminaires shall comply with NEMA LE 4.
7. User Replaceable Lamps:
   a. Bulb shape complying with ANSI C78.79.
   b. Lamp base complying with ANSI C81.61

C. CRI of minimum 80. CCT of 4000 K.

D. Rated lamp life of 50,000 hours to L70.

E. Lamps dimmable from 100 percent to 0 percent of maximum light output.

F. Internal driver.

G. Nominal Operating Voltage: 120 V ac 277 V ac.
1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

2.3 MATERIALS

A. Metal Parts:
1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Diffusers and Globes:
1. Tempered Fresnel glass, prismatic glass, prismatic acrylic clear, UV-stabilized acrylic
2. Acrylic Diffusers: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
3. Glass: Annealed crystal glass unless otherwise indicated.
4. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
1. Label shall include the following lamp characteristics:
a. "USE ONLY" and include specific lamp type.
b. Lamp diameter, shape, size, wattage, and coating.
c. CCT and CRI for all luminaires.

2.4 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.3 INSTALLATION

A. Comply with NECA 1.

B. Install lminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.

D. Comply with requirements in Section 26 05 13 "Low-Voltage Electrical Power Conductors and Cables" for wirig connections.

3.4 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 32 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
   2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

3.6 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.
   1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
   2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
   3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION

SECTION 26 56 19 – LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
2. Luminaire supports.
3. Luminaire-mounted photoelectric relays.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color rendering index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.
1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaire.
4. Lamps, include life, output (lumens, CCT, and CRI), and energy-efficiency data.
5. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project IES LM-79, IES LM-80.
   a. Manufacturer's Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.
   b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
6. Wiring diagrams for power, control, and signal wiring.
7. Photoelectric relays.

8. Means of attaching luminaires to supports and indication that the attachment is suitable for components involved.

B. Shop Drawings: For nonstandard or custom luminaires.
1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Samples: For each luminaire and for each color and texture indicated with factory-applied finish.

D. Product Schedule: For luminaires and lamps.

E. Delegated-Design Submittal: For luminaire supports.
1. Include design calculations for luminaire supports and seismic restraints.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing laboratory providing photometric data for luminaires.

B. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Product Certificates: For each type of the following:
1. Luminaire.
2. Photoelectric relay.

D. Product Test Reports: For each luminaire, for tests performed by a qualified testing agency.

E. Source quality-control reports.

F. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.
1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Glass, Acrylic, and Plastic Lenses, Covers, and Other Optical Parts: One for every 100 of each type and rating installed. Furnish at least one of each type.
   2. Diffusers and Lenses: One for every 100of each type and rating installed. Furnish at least one of each type.
   3. Globes and Guards: One for every 20of each type and rating installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturers' laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products and complying with applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

E. Mockups: For exterior luminaires, complete with power and control connections.
   1. Obtain Architect's approval of luminaires in mockups before starting installations.
   2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.10 FIELD CONDITIONS

A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.

B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.11 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, including luminaire support components.
      b. Faulty operation of luminaires and accessories.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
   1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. Lamp base complying with ANSI C81.61.

F. Bulb shape complying with ANSI C79.1.

G. CRI of minimum 80. CCT of 4000 K.

H. L70 lamp life of 50,000 hours.

I. Lamps dimmable from 100 percent to 0 percent of maximum light output.

J. Internal driver.

K. Nominal Operating Voltage: 120 V ac 277 V ac.

L. Lamp Rating: Lamp marked for outdoor use and in enclosed locations.

M. Source Limitations: Obtain luminaires from single source from a single manufacturer.

N. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.3 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum, Stainless steel. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Diffusers and Globes:
1. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

E. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

F. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

G. Housings:
1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
1. Label shall include the following lamp characteristics:
   a. "USE ONLY" and include specific lamp type.
   b. Lamp diameter, shape, size, wattage and coating.
   c. CCT and CRI for all luminaires.

2.4 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
   2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
   3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
   4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.
      a. Color: As noted on light fixture schedule.

D. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
   2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
      a. Color: As selected from manufacturer's standard catalog of colors.
      b. Color: Match Architect's sample of manufacturer's standard/custom color.
      c. Color: As selected by Architect from manufacturer's full range.

2.5 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.

C. Examine walls, roofs, canopy ceilings and overhang ceilings for suitable conditions where luminaires will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is substantially complete, clean luminaires used for temporary lighting and install new lamps.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Install lamps in each luminaire.

D. Fasten luminaire to structural support.

3.4 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 26 00 03 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.5 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 32 "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Verify operation of photoelectric controls.

C. Illumination Tests:
1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):
   a. IES LM-5.
   b. IES LM-50.
   c. IES LM-52.
   d. IES LM-64.

e. IES LM-72.

2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

3.8 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two Insert number visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION

SECTION 27 00 00 - GENERAL COMMUNICATIONS REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end structured cabling system. This includes - but is not limited to - furnishing and installing cable, cable supports, cable ties, innerduct, racks, cabinets, termination components, ancillary equipment, testing, and labeling and documentation of cables and connectors, for a complete end-to-end solution.

B. Refer to the contract documents for locations of Telecom Rooms (TRs), Equipment Room (ER), and telecommunication outlets (TOs). Note that the port and cable count at each TO may vary by location.

C. It shall be the responsibility of the contractor, to work with the Owner and provide the necessary assistance to make any connections from the owners' outside plant, service provider to establish services which shall ride on the new cabling system. These activities include, but are not limited to patch cords, cross connects, general wiring, documentation, and cable pair identification.

1.2 RELATED DOCUMENTS

A. General and Supplementary Conditions

1.3 RELATED SECTIONS

A. Division 01 – General Conditions

B. Division 07 – Penetration Firestopping

C. Division 26 - Grounding and Bonding

D. Division 26 - Raceway and Boxes

E. Division 26 - Wiring Devices

F. Division 27 - Communications

1.4 ACRONYMS AND DEFINITIONS

A. BICSI: Building Industry Consulting Service International

B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection

C. EMI: Electromagnetic interference

D. Horizontal Cabling: Cabling between and including the telecommunications outlet/connector and the horizontal cross-connect

E. IDC: Insulation displacement connector

F. LAN: Local area network

G. NRTL: Nationally Recognized Testing Laboratory, an independent agency, with the experience and capability to conduct the testing indicated, as defined by OSHA in 29 CFR 1910.7

H. RCDD: Registered Communications Distribution Designer, a BICSI-certification

I. RMC: Rigid metallic conduit

J. TR: Telecom Room

K. UTP: Unshielded twisted pair

L. Cat. 6A: Augmented Category 6 UTP, as defined by TIA standards

1.5 CONTRACTOR QUALIFICATIONS

A. The contractor shall be a company specializing in the installation of communication cable and accessories with a minimum of five years documented experience on similar systems.

B. Must be a current certified partner of the solutions being furnished and installed in order to meet the requirements for the extended warranty and service programs.

C. Must hold a current communications cabling license within the State the project is taking place and must be verifiable for good standing.

D. Contractor must have a current affiliation with BICSI.

E. Within the project’s onsite team, 15% of installers shall hold a BICSI Installer 1 certification, 15% of installers shall also hold a BICSI Installer 2 certification (Both Optical Fiber and Copper). 10% of the team shall hold a BICSI ITS Technician certification and a minimum of (1) team member shall hold a current and valid BICSI RCDD certification.

F. All BICSI certified field installers shall take on roles of Foreman or Team Lead to ensure installations are deemed compliant per codes and standards.

G. Contractor must have satisfactorily completed (3) projects within the past 5 years of similar scope and amount within the same state.

H. The selected Contractor shall provide a Project Manager to act a single point of contact for all activities performed under this section. The Project Manager shall be a Registered Communications Distribution Designer (RCDD). The RCDD shall have a minimum of 3 years experiences in design and installation. The designer must have sufficient experience in this type project(s) as to be able to lend adequate technical support to the field forces during installation, during the warranty period and during any extended warranty periods or maintenance contracts. The Contractor must attach a resume of the responsible designer to the Contractor's submittal for evaluation.

I. The Project Manager, or designee thereof, shall be required to attend project meetings as required until project closeout/signoff.

J. Should the Project Manager assigned to this project change during the installation, the new Project Manager assigned must meet all qualifications stated in this section, and must also submit a resume for review by the Consultant.

K. If, in the opinion of the Consultant, the Project Manager does not possess adequate qualifications to support the project, the Consultant reserves the right to require the Contractor to assign a designer whom, in the Owner's opinion, possesses the necessary skills and experience required of this project.

1.6 REGULATORY REFERENCES

A. ANSI/NFPA 70

B. City of Altadena Building Code.

C. ANSI/IEEE C2 - National Electrical Safety Code (NESC)

D. NFPA 70-2011 - National Electrical Code (NEC)

E. ANSI/TIA-568-C.0 – Generic Telecommunications Cabling for Customer Premises, published February 2009 and all latest addenda derived from ANSI/TIA 568-B

F. ANSI/TIA-568-C.1 – Commercial Building Telecommunications Cabling Standard, published February 2009 and all latest addenda derived from ANSI/568-B

G. ANSI/TIA-568-C.2 – Balanced Twisted Pair Telecommunication Cabling and Components Standard, published August 2009 and all latest addenda derived from ANSI/TIA 568-B

H. ANSI/TIA-568-C.3 – Optical Fiber Cabling Components Standard, published June 2008 and all latest addenda derived from ANSI/TIA 568-B

I. ANSI/TIA/EIA 569-B - Commercial Building Standard for Telecommunications Pathways and Spaces

J. ANSI/TIA-606-B – Administration Standard for Telecommunications Infrastructure, published June 2012 including all latest addenda derived from TIA-606-A

K. ANSI/TIA-607-B – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

L. ANSI/TIA-758-A Customer Owned Outside Plant Telecommunications Infrastructure Standard

M. IEEE 142 "Green Book"- Recommended Practice for Grounding of Industrial and Commercial Power Systems

N. UL 444 - Standard for Communications Cable

O. Rural Electrification Administration (REA) PE-89 - specification for filled telephone cables with expanded insulation

P. Rural Electrification Administration (REA) PE-39 - specification for filled telephone cables

Q. CEC Article 18-27-300.22©(1)

R. NEC Article 250 for System Grounding

S. NEC Articles 770 and 800 for Cable Listing Requirements

T. Work performed should additionally comply with and follow guidelines established in the latest edition/revision, as of the date of the Contract Documents, of the following publications:
   1. BICSI Telecommunications Distribution Methods Manual (TDMM)
   2. BICSI Outside Plant Design Reference Manual (OSPDRM)
   3. National Electrical Contractors Association (NECA)/BICSI ANSI/NECA/BICSI-568-2006 Standard for Installing Commercial Building Telecommunications Cabling

U. All materials shall be new and listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

V. Notify Consultant of all material believed to be inadequate, unsuitable, in violation of law, ordinances, rules or regulations of authorities having jurisdiction.

1.7 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Consultant for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Consultant for a decision before proceeding.

1.8 SUBMITTALS

A. Submittals shall include complete documentation of the system, products and accessories in a single submittal. Incomplete submittals will be returned unreviewed.

B. Prior to the start of work the Contractor shall submit shop drawings in an electronic form. Plans shall be fresh designs by the contractor; they cannot be overlays of the Consultant’s package which are indicative as the contract documents. Shop drawings shall contain:
   1. Full size floor plans showing proposed cable routing, wire basket routes, labeling of all outlets, locations of pullboxes.
   2. Full size floor plans and elevations of all telecommunication room racks and cabinets; also include all walls with equipment.
   3. Floor plans must include all outlet locations including identifiers as numbered and/or lettered characters per jack as determined by the contractor. These identifiers must match the corresponding jack within each patch panel within the TR.

4. List of identifier numbers or letters for outlet jacks and corresponding TR patch panel jack shall be included as part of the complete run-list on the floor plan sheets or on separate dedicated run-list sheet(s). This run-list shall be used as a placeholder for final outlet & jack labeling.
5. The run-list must be accurate and shall be printable for submitting to the owner for final patch cord planning and management.
6. Elevations shall indicate part numbers and quantities for all equipment.
7. Elevations of all type of outlet faceplates which shall include the configuration for jacks, blanks and the intended outlet labeling schemes.
8. Floor plans shall include all ladder rack or overhead cable distribution hardware within the telecommunications rooms to be installed per manufacturer's instructions.
9. Outside plant manhole and handhole designs coordinated with electrical as well as the site environment.
10. Outside plant conduit arrangement details within ductbank and within the manholes and handholes as necessary.
11. Outside plant conduit ductbank overall routing coordinated with electrical as well as the site environment.
12. All seismic bracing and support details shall be provided in coordination with the general contractor as needed.

C. Submittals shall include faceplates mockups sent to the Consultant for final review. Mockups shall have the manufacturer's cable markings clearly visible. The following are standard items that are to be submitted.
1. Wall mounted outlet complete with faceplate, terminated jacks, blanks, and labeling for all types of outlets in project. Outlet should also contain 24" minimum of the cable proposed for the project.
2. Wireless outlet complete with jacks, blanks, and labeling.
3. Wall phone (stainless steel) outlet.
4. Modular furniture outlet complete with faceplate, jacks, blanks and labeling.
5. Raceway outlet complete with faceplate, bezel, jacks, blanks and labeling.
6. Floorbox outlet complete with faceplate, mounting plate, jacks and labeling.

D. Where applicable, dimensions should be marked in units to match those specified.

E. Work shall not proceed without the consultant's "no exception taken" of the submitted items.

F. Floor plans will be provided to the Contractor in electronic (AutoCAD, ".dwg") formats to be utilized by the contractor in creating complete submittals and as-built documentation. These modified documents shall be provided to the Owner as part of the Record Documents.

G. All submittal documentation shall bear the stamp of a currently verifiable BICSI RCDD.

H. Plans shall be fresh designs by the Contractor; they cannot be overlays of the Consultant's package which is indicative as contract documents.

I. Contractor must submit documentation to support all Contractor Qualifications and Requirements under Section 1.5 which is to include but not limited to the following:
1. End to end solution and partner documentation indicating contractor's staff has gone through proper channels and training support a minimum 25 year warranty and service program by the manufacturers.
2. BICSI affiliations by contractor.
3. BICSI cabling team's RCDD, Installer 1, Installer 2 (Optical Fiber and Copper) and ITS Technician certifications.
4. Current copy of the State contractor's license for Communications Cabling.

5. Documentation of (3) similar projects within the past 5 years in the same State.

J. Contractor shall include data sheets and literature of test equipment to be used for fiber and copper cabling and components.

1.9 Manufacturer Certified WARRANTY

A. The manufacturer shall be a company specializing in communication cable and/or accessories with a minimum of five years documented experience in producing cable and/or accessories similar to those specified below.

B. The system shall be comprised of components from a single manufacturer or a combination of manufacturers entering into a partnering agreement that allows for a warranty of the system.

C. System warranty program documents must be from that of the cabling and component manufacturer and associated partners. Cabling and component warranty programs offered by the contractor alone are not acceptable.

D. The warranty period shall be for not less than 25 years and warranty the cabling system and components will perform to the stated specifications for the warranty period.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

B. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

C. Requirement for specialists shall not supersede building codes and regulations governing the Work.

D. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material and design.

1.11 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work.

D. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 GENERAL

A. Contractor shall follow standard industry installation practices as described in the latest release of the BICSI TDMM.

B. Contractor shall be responsible for identifying and reporting to the Site Coordinator(s) any existing damage to walls, flooring, tiles and furnishings in the work area prior to start of work. All damage to interior spaces caused by the installation of cable, pathways or other hardware must be repaired by the Contractor. Repairs must match preexisting color and finish of walls, floors and ceilings. Any contractor-damaged ceiling tiles are to be replaced to match color, size, style and texture.

C. The installation shall be supervised on site by a BICSI certified installer.

D. The contractor shall have on staff a BICSI certified RCDD. RCDD certification shall be current and each submittal shall bear the stamp of the RCDD.

E. Outlets shall be mounted flush on a wall-mounted box, on Surface Raceway and in Modular Furniture. Information Outlet locations are identified on Project Drawings.

F. Avoid abrasion and other damage to cables during installation. Any cable damaged during installation shall be removed and a new cable installed.

G. Cables shall be a continuous run. No in-line splices are permitted except were explicitly indicated on the drawings.

3.2 DELIVERY AND STORAGE

A. Receive, handle, and store telecommunications system items and materials at the project site. Materials and items shall be so placed that they are protected from damage and deterioration.

3.3 INSTALLATION

A. The drawings for work under Division 27 Sections related to communication systems are diagrammatic and are intended to convey the scope of work and indicate the general arrangement of conduit, boxes, equipment, termination hardware, fixtures and other work included in the Contract.

B. The Contractor shall verify all dimensions and clearances before procuring any equipment.

C. Location of items required by the drawings or specifications not definitely fixed by dimensions are approximate only and exact locations necessary to secure the best conditions and results shall be determined at the site and shall be subject to the approval of the Architect/Telecom Design Engineer.

D. Follow drawings in laying out work, check drawings of other trades to verify spaces in which work will be installed, and maintain maximum headroom and space conditions at all points.
   1. Where space conditions appear inadequate, the Architect/Telecom Design Engineer shall be notified before proceeding with installation.
   2. Minor conduit and cable tray rerouting and changes shall be made at no additional cost to the Owner.
   3. As necessary, adjust elevations of rack-mounted termination hardware and horizontal wire management panels so as to compensate for rack unit sizes of actual hardware used, as compared to hardware rack unit sizes depicted in Contract Drawings.

E. Perform all work with skilled mechanics of the particular trade involved in a neat and workmanlike manner.

F. Perform all work in cooperation and coordination with other trades and schedule.

G. Furnish other trades advance information on locations and sizes of frames, boxes, sleeves and openings needed for the work, routes for conduit and cable tray raceway, and also furnish information and shop drawings necessary to permit trades affected to install their work properly and without delay.

H. Where there is evidence that work of one trade will interfere with the work of other trades, all trades shall assist in working out space allocations to make satisfactory adjustments and shall be prepared to submit and revise coordinated shop drawings.

I. With the approval of the Architect/Consultant and without additional cost to the Owner, make minor modifications in the work as required by structural interferences, by interferences with work of other trades or for proper execution of the work.

J. Work installed before coordinating with other trades so as to cause interference with the work of such other trades shall be changed to correct such condition without additional cost to the Owner and as directed by the Architect.

K. Minor changes in the locations of outlets, fixtures and equipment shall be made prior to rough in at the direction of the Architect/Consultant and at no additional cost to the Owner.

L. Contractor shall cooperate with other trades and coordinate work so that conflicts with other work are eliminated.

M. Equipment shall be installed with adequate space allowed for removal, repair or changes to equipment. Ready accessibility to removable parts of equipment and to wiring shall be provided without moving other equipment which is to be installed or which is in place. Contractor shall verify measurements. Discrepancies shall be brought to the Architect/Telecom Design Engineer's attention for interpretation.

N. Determine temporary openings in the buildings that will be required for the admission of apparatus furnished under this Division, and notify the Architect/Consultant accordingly. In the event of failure to give sufficient notice in time to arrange for these openings during construction, assume all costs of providing such openings thereafter.

O. Location of telecommunication outlets and raceway pathways are approximate and exact locations shall be determined on site.

P. Contractor shall refer to contract documents for details, reflected ceiling plans, and large scale drawings.

3.4 COORDINATION

A. The Contractor shall be responsible for the coordination of telecommunications work with the work of all other trades and shall, in preparing the drawings, check the work of other trades in order to avoid possible installation conflicts arising therefrom. It shall be understood that the work shown on the shop drawings has been so coordinated. In the event of conflicts or interference that cannot be resolved in the field, the Contractor shall request a written clarification from the Architect/Consultant.

B. Coordinate service entrance arrangement with local exchange carrier(s).
1. Meet jointly with local exchange carrier representatives and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
2. Record agreements reached in meetings and distribute to other participants.
3. Adjust arrangements and locations of distribution frames and cross-connect and patch panels in equipment rooms and wiring closets to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.

C. Where work covered by this Section connects to equipment furnished under other Sections, verify telecommunications work involved in the field and make proper connection to such equipment.

END OF SECTION

SECTION 27 05 26 - GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1. SUMMARY

A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end structured cabling system. This includes grounding and bonding of all passive and active equipment supplied by contractor and owner.

B. This Section includes grounding of communications systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.2. QUALITY ASSURANCE

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NEC, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
   1. Comply with UL 467.

1.3. RELATED DOCUMENTS

D. General and Supplementary Conditions

1.4. RELATED SECTIONS

E. Division 26 - Grounding and Bonding

F. Division 26 - Raceway and Boxes

G. Division 26 - Wiring Devices

H. Division 27 - Communications

PART 2 - PRODUCTS

1.5. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by approved manufacturers listed in Division 26 section, “Grounding and Bonding for Electrical Systems.”

1.6. GROUNDING CONDUCTORS

B. For insulated conductors, comply with Division 26 Section “Conductors and Cables.”

C. Communications Copper Bonding Conductors: As follows:

1. Telecommunications Bonding Conductor (TBC) and Telecommunications Bonding Backbones (TBB): No. 3/0, stranded copper conductor, insulated.
2. Telecommunications Equipment Bonding Conductor (TEBC): No. 6 AWG, stranded copper conductor, insulated.

1.7. CONNECTOR PRODUCTS

D. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

E. Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

1.8. TELECOMMUNICATIONS GROUNDING BUSBAR

F. Comply with ANSI/TIA-607-B.

G. Telecommunications Main Grounding Busbar (TMGB): Electro-tin plated copper, minimum 1/4 inch thick by 4 inches wide by minimum 20” long, with holes sized, spaced and in minimum quantities as follows:
1. 5/16” holes at 5/8” spacing, minimum quantity of 27
2. 7/16” holes at 1” spacing, minimum quantity of 3
3. Provide longer TMGB as necessary to accommodate quantity of actual bonding connections required in field.

H. Telecom Grounding Busbar (TGB): Electro-tin plated copper, minimum 1/4 inch thick by 2 inches wide by minimum 12” long, with holes sized, spaced and in minimum quantities as follows:
1. 5/16” holes at 5/8” spacing, minimum quantity of 6
2. 7/16” holes at 1” spacing, minimum quantity of 3
3. Provide longer TGB as necessary to accommodate quantity of actual bonding connections required in field, per communications room.

PART 2 - EXECUTION

2.1. INSTALLATION

I. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

J. Bond metallic raceways used for routing of communications bonding conductors, to the communications bonding conductor at each end.

2.2. CONNECTIONS

K. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.

2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

L. Equipment Grounding Conductor Terminations: Use pressure-type grounding lugs.

M. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

N. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

2.3. TELECOMMUNICATIONS GROUNDING AND BONDING

O. Comply with NEC, ANSI/TIA-607-B and UL 467.

P. Comply with telecommunications ground details and riser diagrams in Contract Drawings.

Q. Telecommunications Grounding Busbars: TMGB and TMB within facility to provide for telecommunications grounding system.
1. Locate grounding terminals in each telecommunications room.
2. Mount on wall of telecommunications entrance facility, equipment room, and closet, with standoff insulators.

R. Bonding Conductors:
1. Extend a TBC from TMGB to electrical entrance facility and connect to grounding electrode system.
2. Extend a TBB from TMGB to each TGB.
3. Extend a TEBC from TGB to ground terminals at communication relay racks, wall-mount communication racks and cabinets, primary protection blocks, overhead ladder rack runway systems and cable basket tray systems.

S. Special Requirements:
1. Bonding conductors shall be insulated copper, sized as noted in Contract Drawings.
2. Bonding conductors shall be installed without splices unless as noted in telecommunications grounding riser diagram, or as approved by Architect because of special circumstances. Where splices are necessary, they shall be accessible. Splices shall be by irreversible compression connectors or by exothermic welding.

T. Primary Protectors
1. Primary protectors shall be installed on each cable end, in the appropriate building entrance protector.
2. Primary protector enclosure shall be bonded to the building grounding system utilizing a minimum #6 AWG ground wire.

U. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

END OF SECTION

SECTION 27 05 28 - PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end structured cabling system. This includes pathways for distribution and protection of cabling and components.

1.2 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NEC, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467.

C. General Requirements: Comply with ANSI/TIA-569-B.

D. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
   1. Support brackets with cable tie slots for fastening cable ties to brackets.
   2. Lacing bars, spools, J-hooks, and D-rings.
   3. Straps and other devices.
   4. Bridle rings not permissible unless furnished with cable saddles.

1.3 RELATED DOCUMENTS

A. General and Supplementary Conditions

1.4 RELATED SECTIONS

A. Division 26 - Grounding and Bonding

B. Division 26 - Raceway and Boxes

C. Division 26 - Wiring Devices

D. Division 27 – Communications

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by approved manufacturers listed in Division 26 section, “Grounding and Bonding for Electrical Systems.”

2.2 CONDUIT AND ELECTRICAL BOXES

A. Comply with requirements in Division 26 Section “Raceways and Boxes.” Flexible metal conduit shall not be used, except as indicated in Contract Drawings. Coordinate with layout and sizing details and requirements as indicated in Contract Drawings.
   1. Outlet boxes shall be no smaller than 4 inches wide, 4 inches high and 2-1/8 inches deep.
   2. Minimum conduit to telecom outlet locations: Trade Size 1, unless otherwise noted in Contract Drawings

2.3 J-HOOK

A. J-Hook shall have a flat bottom and provide a minimum of 1-5/8 inch cable bearing surface.

B. J-Hook shall have 90 degree radius edges to prevent damage while installing cables.

C. J-Hook shall be designed so the mounting hardware is recessed to prevent cable damage.

D. J-Hook shall have a stainless steel cable latch retainer to provide containment of cables within the hook. The retainer shall be removable and reusable.

E. J-Hook shall be factory assembled for direct attachment to walls, hanger rods, beam flanges, purlins, strut, floor posts, etc. to meet job conditions.

F. Factory assembled multi-tiered j-hooks shall be used where required to provide separate cabling compartments, or where additional capacity is needed.

2.4 Cable Ties

A. Bundle and support all cables and to provide a neat and orderly cabling installation.

B. Velcro tie wraps shall be used in the telecom room. Zip ties and wraps that cannot be adjusted once installed are not acceptable.

C. Velcro tie wraps shall be used for bundling all horizontal cabling which shall be supported by J-hooks.

D. Velcro tie wraps shall be provided at 3 ft. intervals minimum. On completion of installation, all cable bundles shall be neatly run and re-tied.

E. Provide a minimum of 30% overlap of wrap for each tie.

F. Wraps shall be Black in color.

G. Velcro wraps shall be plenum rated in all areas outside the telecom rooms.

2.5 Distribution Rings (D-rings).

A. Must be used to support and dress out cables on plywood backboards vertically and horizontally. Cables shall not be supported by cable ties alone on backboard.

B. Individual D-rings shall be sized to allow a minimum of 50% spare capacity for future cable installation.

PART 3 - EXECUTION

3.1 GENERAL

A. Cable shall be neatly dressed out in telecom rooms.

B. Secure cabling with Velcro type cable wraps only.

C. Install distribution rings on plywood backboards to support cables.

3.2 J-HOOKS

A. Provide J-hooks to support communications cables at locations where cable tray and/or conduit is not provided.

B. Provide J-hooks assemblies on 4-foot intervals to support all outlet cables. Install J-hooks approximately 12 inches above lay-in ceiling. Use J-hooks to support not more than 50 cables per hook. Provide additional hooks in rows as required to support more than 50 cables.

C. Individual J-hooks shall be arranged to allow a minimum of 50% spare capacity for future cable installation.

D. Secure J-hooks to concrete slab using threaded expansion anchor bolts. Drill slab and install expansion bolt.

E. Coordinate location with HVAC duct and lights. Do not install above fluorescent lighting fixtures.

1.1. CABLE WRAP AROUND SLEEVING (ALL OPEN OFFICE AREAS)

A. Provide braided sleeving over bundles of cables entering the workstation islands from the walkerduct, poke-thru, floorbox & raised floor grommet provisions.

B. Product must be a braided polyethylene material.

C. Sleeving must be sized to accommodate the diameter of cable bundles as needed.

D. Product must be flexible and expandable to accommodate the routing of cable and expansion for 15% of future cabling capacity.

E. Color options must be submitted for review by the design team.

F. Provide Techflex FlexoPet product or equal subject to review.

END OF SECTION

SECTION 27 08 00 -COMMISSIONING OF COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered under this Section shall consist of a testing, documenting, and commissioning of an operable end to end structured cabling system.

B. Complete installation shall comply with the campus or owner's latest telecommunication and IT standards documents.

1.2 RELATED SECTIONS

A. Division 27

1.3 Project As-Built And Closeout Documents

A. Accurately record exact sizes, locations, heights and quantities of cables and Information Outlets.

B. As-built drawings shall indicate all final cable routes and final outlet locations. Outlet locations shall be identified by their sequential number as defined elsewhere in this document. Numbering, icons and drawing conventions used shall be consistent throughout all documentation provided.

C. As-built drawings must include all final labeling information at every outlet derived from initial run-list produced within shop drawings as described per all items under Section 27 00 00-1.8-B.

D. Final labeling must include labeling on the patch panels within the TRs & ER.

E. Drawings shall indicate final TR & ER locations along with their final build

F. Drawings shall indicate final TR & ER locations along with their final build out conditions at end of the project.

G. Submit bound folders of product used in the project for record.

H. Submit cable tester calibration reports.

I. Submit all copper and fiber optic test results as indicated in Part 3 of this specification. This should include every cable channel installed in the project.

J. Plans shall be provided in full size PDF, AutoCAD or REVIT format within a CD or DVD along with hard copies.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 GENERAL

A. Contractor shall follow standard industry installation practices as described in the latest release of the BICSI TDMM.

3.2 IDENTIFICATION AND LABELING

A. All backbone and station cables, faceplates and termination components shall be clearly labeled in accordance with EIA/TIA 606-B.

B. The Contractor shall obtain the labeling scheme from the Owner.

C. Labels strips shall be covered with a protective plastic coating. Labels shall be machine printed. No handwritten label shall be accepted. Stick-on labels are not acceptable.

D. Components
1. The labeling made for each component should be:
    a. Unique, to prevent confusion with similar components.
    b. Legible and permanent enough to last the lifecycle of the component.
    c. The following infrastructure components should be labeled:
        1) Telecommunications spaces
        2) Telecommunications pathways
        3) Telecommunications cables
        4) Zone boxes
        5) Connecting hardware
        6) Grounding (earthing) system

E. Telecommunications Spaces
1. Telecommunications spaces include:
    a. Equipment rooms (ERs)
    b. Telecommunication rooms (TRs)
    c. Telecommunication enclosures (TEs)
    d. Work areas
2. Spaces should be labeled at their entrances, as follows:
    a. In small, single-story buildings, a simple sign on the door is sufficient.
    b. In larger buildings, the labeling should provide a unique identifier, since there may be a number of telecommunications spaces.

F. Telecommunications pathways
1. Labeling of pathways helps prevent inadvertent installation of cables from systems that may interfere with each other.
2. When labeling pathways, the following guidelines should be met:
    a. Labeling should be affixed at the ends of each pathway.
    b. Pathways should be labeled at regular intervals and wherever they are accessible.

c. In a basic system, the conduits should be marked from the main ER by painting or using a permanent-colored tape-wrap made for this purpose.
d. In systems utilizing zone boxes for consolidation or distribution of low-voltage systems, each box label should include the information about the room of origin and system usage.
e. In complex systems or large buildings:
1) A striped tape should wrap pathways with the base color identifying them as telecommunications pathways and tracer color identifying the individual uses.
2) Each pathway should be assigned a unique alphanumeric identifier.
3) All wall or floor penetrations should be labeled.

3. Telecommunications cables
a. When labeling telecommunications cables:
1) Cables should be identified at each end with a permanent label or physical/electronic tag. The same alphanumeric identifiers should be used at both ends of the cable.
2) Cable should be identified at regular intervals throughout its length with its alphanumeric identifier when cables are rearranged, rerouted, or removed in spite of the added cost.
b. In systems that are:
1) Basic, the labeling scheme can be a simple number sequence.
2) Complex, the labeling may indicate the type, function, and terminating position.

G. Connecting hardware
1. Connecting hardware items (e.g., cross-connect fields and telecommunications outlet/connectors) require a unique, alphanumeric identification such as the following three-level scheme:
a. First level – Termination field or patch panel. Color-coding or other labeling should be used to uniquely identify each termination field on a common mechanical assembly.
b. Second level – Terminal block within a given field or patch panel, which could be a row of insulation displacement connectors (IDCs), optical fiber connectors, or modular jacks.
c. Third level – Defines the individual position within a given terminal block or patch panel.

H. Grounding (Earthing)
1. Grounding system components (e.g., ground bars and grounding conductors) require special labeling for safety and noise control purposes and for simplifying and expediting ground system audits.
2. All equipment grounding conductors should be labeled to indicate the:
a. Grounded rack, cabinet, or shelf.
b. Ground bar to which the grounding conductors are connected.
3. Each grounding conductor in a building should be labeled, including those connecting building steel, grounding electrodes, water pipes, radio towers, and telecommunications structural components.

3.3 TESTING AND COMPLIANCE

A. The Contractor is responsible for supplying all equipment and personnel necessary to conduct the acceptance tests. Testing shall be executed by technicians holding proof of successful installation certification from the system manufacturer.

B. Cable testers are to be calibrated within four (4) months of use.

C. Prior to testing, the Contractor shall provide a summary of the proposed test plan for each cable type including equipment to use, set-up, test frequencies or wavelengths, results format, etc.

D. 100% of the installed cabling links must be tested in accordance with ANSI/TIA/EIA-568-B standard and must pass the requirements described under the heading for each cable type. Any failing link must be diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements. The final and passing result of the tests for all links shall be provided in the test results documentation.

E. A Pass or Fail result for each parameter is determined by comparing the measured values with the specified test limits for that parameter. The test result of a parameter shall be marked with an asterisk (*) when the result is closer to the test limit than the accuracy of the field tester. The Pass or Fail condition for the link-under-test is determined by the results of the required individual tests. Any Fail or Fail* result yields a Fail for the link-under-test. In order to achieve an overall Pass condition, the results for each individual test parameter must Pass or Pass*.

F. The Contractor shall conduct acceptance testing according to a schedule coordinated with the Owner. Representatives of the Owner shall be invited to be in attendance to witness the test procedures. The contractor shall provide a minimum of one (1) week advance notice to the Engineer as to allow for such participation. The notification shall include a written description of the proposed conduct of the tests including copies of blank test result sheets to be used.

G. A representative of the end-user shall be invited to witness field testing. The representative shall be notified of the start date of the testing phase 5 business days before testing commences. A representative of the Owner reserves the right to select a random sample of up to 5% of the installed links for retesting. The Contractor shall re-test these randomly selected links and the results are to be stored in the tester. The results obtained shall be compared to the original test data provided by the Contractor. If more than 2% of the sample pass/fail results differ from the original test data, the installation contractor under supervision of the Owner’s representative shall repeat 100% testing and the cost shall be borne by the Contractor.

3.4 CABLING ADMINISTRATION DRAWINGS

A. Prepare Cabling Administration Drawings showing building floor plans with cable administration-point identification labeling. Depict all telecommunications outlets and their associated label, provide callouts indicating locations of telecom rooms and spaces and, where applicable, indicate zone line demarcations denoting areas served by each respective telecom room. Coordinate drawing features with shop drawing requirements outlined in Section 27 00 00.

B. Prepare Drawings for use as part of cabling installation work. Periodically update Drawings to reflect constructed conditions, including any moves, changes or additions to the communications infrastructure. At completion, Cabling Administration Drawings shall reflect as-built conditions.

C. Interim Submission: Issue two (2) half-size printed copies of in-progress draft Cabling Administration Drawings to Owner no later than five (5) weeks prior to Substantial Completion, for Owner’s use in preparation of patch schedules and to support other internal move-in planning processes. Coordinate exact timing with Owner’s IT personnel.

3.5 TEST RESULTS DOCUMENTATION

A. The test results information for each link shall be recorded in the memory of the field tester upon completion of the test. The test result records saved by the tester shall be transferred into a spreadsheet or database that allows for the maintenance, inspection and archiving of these test records. Provide the database for the completed job on CD-ROM. If the results cannot be viewed by Microsoft Excel or Microsoft Access, the Contractor shall provide one licensed copy of a software package suitable to view and print reports of the test results.

B. Upon completion of the installation, the contractor shall provide three (3) full electronic documentation sets to the Consultant for approval.

C. Documentation shall be submitted within ten (10) working days of the completion of the testing phase. This includes draft as-built drawings. Draft drawings may include annotations done by hand.

D. Machine generated final copies of all drawings shall be submitted within 30 working days of the completion of the testing phase. Final copies shall have all annotations in CAD format.

E. All documentation, including hard copy and electronic forms shall become the property of the Owner.

F. A paper copy of the test results shall be provided that lists all the links that have been tested along with the following summary information:
   1. The identification of the customer site as specified by the end-user.
   2. The identification of the link in accordance with the naming convention defined in the overall system documentation.
   3. The overall Pass/Fail evaluation of the link-under-test.
   4. The date and time the test results were saved in the memory of the tester.

G. The following information shall be provided in the electronic database of the test results information for each link:
   1. The identification of the customer site as specified by the end-user.
   2. The identification of the link and/or fiber in accordance with the naming convention defined in the overall system documentation.
   3. The overall Pass/Fail evaluation of the link-under-test.
   4. The date and time the test results were saved in the memory of the tester.
   5. The name of the standard selected to execute the stored test results.
   6. The cable type and the value of NVP or index of refraction used for length calculations.
   7. The brand name, model and serial number of the tester.
   8. The identification of the tester interface.
   9. For fiber tests, the identification of each link/fiber in accordance with the naming convention defined in the overall system documentation
   10. For fiber tests, the insertion loss (attenuation) measured at each wavelength, and the test limit calculated for the corresponding wavelength.
   11. For fiber tests, the link length shall be reported for each optical fiber for which the test limit was calculated based on the formulas above.
   12. The revision of the tester software and the revision of the test standards database in the tester.

H. The test results information must contain information on each of the required test parameters in accordance with the descriptions above. For each of the frequency-dependent test parameters, the value measured at every frequency during the test shall be reported.

3.6 CATEGORY 6 CABLING

A. The test parameters for cat 6 are defined in TIA Cat 6 standard, which refers to the ANSI/TIA-568-C.2 standard. The test of each link shall contain all of the following parameters as detailed below. In order to pass the test all measurements (at each frequency in the range from 1 MHz through 250 MHz) must meet or exceed the limit value determined in the above-mentioned standard.

B. The test equipment (tester) for cat 6 cabling shall comply with the accuracy requirements for the proposed level III field testers as defined in the TIA Cat 6 Document. The tester including the appropriate interface adapter must meet the specified accuracy requirements. The accuracy requirements for the permanent link test configuration are specified in Table B.2 of Annex B of the TIA Cat 6 Standard.

C. The following parameters shall be tested for each cable:
1. Length – The length of the cable shall be defined as the length of the pair with the shortest electrical length.
2. Wire Map – The wire map shall indicate continuity to the remote end for all conductors; identify any shorts between conductors; and identify transposed, reversed or split pairs. Any incorrect parameters shall be corrected.
3. Insertion Loss – Insertion loss shall be measured in decibels (dB) and tested in a maximum step size of 1 MHz. All of the test points shall be provided in the test results.
4. Near End Crosstalk (NEXT) – NEXT shall be measured on each wire pair combination from each end of the link for a total of 12 pair combinations. The maximum step size shall not exceed the parameters in Table 1.
5. Power Sum NEXT (PSNEXT) – PSNEXT shall be measured on each wire pair from each end of the link for a total of 8 measurements. The maximum step size shall not exceed the parameters in Table 1.
6. Equal Level Far End Crosstalk (ELFEXT) – ELFEXT shall be measured on each wire pair combination from each end of the link for a total of 24 pair combinations. The maximum step size shall not exceed the parameters in Table 1.
7. Power Sum ELFEXT (PSELFEXT) – PSELFEXT shall be measured on each wire pair from each end of the link for a total of 8 measurements. The maximum step size shall not exceed the parameters in Table 1.
8. Return Loss – Return loss shall be measured on each wire pair from each end of the link for a total of 8 measurements. The maximum step size shall not exceed the parameters in Table 1.
9. Propagation Delay – Propagation delay shall be measured on each wire pair for a total of 4 measurements.
10. Delay Skew – Delay skew shall be defined as the difference between the fastest and slowest pairs in a cable.

Table 1

Frequency Range (MHz)	Maximum Step size (MHz)
1 – 31.25	0.15
31.26 – 100	0.25
100 – 250 (Cat 6 only)	0.50

3.7 CATEGORY 6A CABLING

A. Each category 6A cabling link in the installation shall be tested in accordance with the field test specifications defined in ANSI/TIA-568-C.2 “Commercial Balanced Twisted-Pair Telecommunications Cabling and Components Standard”

B. In order to pass the test all measurements (at each frequency in the range from 1 MHz through 500 MHz) must meet or exceed the limit value determined in the above-mentioned standard.

C. The test equipment (tester) shall comply with the accuracy requirements for level IIIe field testers as defined in ANSI/TIA-1152. The tester including the appropriate interface adapter must meet the specified accuracy requirements. The accuracy requirements for the permanent link test configuration (baseline accuracy plus adapter contribution) are specified in Table 4 of ANSI/TIA-1152.

D. The following parameters shall be tested for each cable:
   1. Wire Map – Shall report Pass if the wiring of each wire-pair from end to end is determined to be correct. The Wire Map results shall include the continuity of the shield connection if present.
   2. Length – The field tester shall be capable of measuring length of all pairs of a basic link or channel based on the propagation delay measurement and the average value for NVP (1). The physical length of the link shall be calculated using the pair with the shortest electrical delay. This length figure shall be reported and shall be used for making the Pass/Fail decision. The Pass/Fail criteria are based on the maximum length allowed for the Permanent Link configuration (90 meters – 295 feet) plus 10% to allow for the variation and uncertainty of NVP.
   3. Insertion Loss (Attenuation) – Insertion Loss is a measure of signal loss in the permanent link or channel. The term “Attenuation” has been used to designate “Insertion Loss.” Insertion Loss shall be tested from 1 MHz through 500 MHz in maximum step size of 1 MHz. It is preferred to measure insertion loss at the same frequency intervals as NEXT Loss in order to provide a more accurate calculation of the Attenuation-to-Crosstalk ratio (ACR) parameter. Minimum test results documentation (summary results): Identify the worst wire pair (1 of 4 possible). The test results for the worst wire pair must show the highest attenuation value measured (worst case), the frequency at which this worst case value occurs, and the test limit value at this frequency.
   4. NEXT Loss – Pair-to-pair near-end crosstalk loss (abbreviated as NEXT Loss) shall be tested for each wire pair combination from each end of the link (a total of 12 pair combinations). This parameter is to be measured from 1 through 500 MHz. NEXT Loss measures the crosstalk disturbance on a wire pair at the end from which the disturbance signal is transmitted (near-end) on the disturbing pair. The maximum step size for NEXT Loss measurements shall not exceed the maximum step size defined in the standard. Minimum test results documentation (summary results): Identify the wire pair combination that exhibits the worst case NEXT margin (2) and the wire pair combination that exhibits the worst value of NEXT (worst case). NEXT is to be measured from each end of the link-under-test. These wire pair combinations must be identified for the tests performed from each end. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.
   5. PS NEXT Loss – Power Sum NEXT Loss shall be evaluated and reported for each wire pair from both ends of the link under-test (a total of eight results). PS NEXT Loss captures the combined near-end crosstalk effect (statistical) on a wire pair when all other pairs actively transmit signals. Like NEXT this test parameter must be evaluated from 1 through 500 MHz and the step size may not exceed the maximum step size defined in the standard. Minimum test results documentation (summary results): Identify the wire pair that exhibits the worst-case margin and the wire pair that exhibits the worst value for PS NEXT. These wire pairs must be identified for the tests performed from each end. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.
   6. ACR-F, pair-to-pair – Attenuation Crosstalk Ratio Far-end is calculated from the pair-to-pair FEXT Loss. It shall be measured for each wire-pair combination from both ends of the link under-test. FEXT Loss measures the crosstalk disturbance on a wire pair at the

opposite end (far-end) from which the transmitter emits the disturbing signal on the disturbing pair. FEXT is measured to compute ACR-F Loss that must be evaluated and reported in the test results. ACR-F measures the relative strength of the far-end crosstalk disturbance relative to the attenuated signal that arrives at the end of the link. This test yields 24 wire pair combinations. ACR-F is to be measured from 1 through 500 MHz and the maximum step size for FEXT Loss measurements shall not exceed the maximum step size defined in the standard. Minimum test results documentation (summary results): Identify the wire pair combination that exhibits the worst-case margin and the wire pair combination that exhibits the worst value for ACR-F. These wire pairs must be identified for the tests performed from each end. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.

7. PS ACR-F Loss – Power Sum Attenuation Crosstalk Ratio Far-end is a calculated parameter that combines the effect of the FEXT disturbance from three wire pairs on the fourth one. This test yields eight wire-pair combinations. Each wire-pair is evaluated from 1 through 500 MHz in frequency increments that do not exceed the maximum step size defined in the standard. Minimum test results documentation (summary results): Identify the wire pair that exhibits the worst pair combinations must be identified for the tests performed from each end. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.
8. Return Loss – Return Loss (RL) measures the total energy reflected on each wire pair. Return Loss is to be measured from both ends of the link-under-test for each wire pair. This parameter is also to be measured form 1 through 500 MHz in frequency increments that do not exceed the maximum step size defined in the standard. Minimum test results documentation (summary results): Identify the wire pair that exhibits the worst-case margin and the wire pair that exhibits the worst value for Return Loss. These wire pairs must be identified for the tests performed from each end. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.
9. Propagation Delay – Propagation delay is the time required for the signal to travel from one of the link to the other. This measurement is to be performed for each of the four wire pairs. Minimum test results documentation (summary results): Identify the wire pair with the worst-case propagation delay. The report shall include the propagation delay value measured as well as the test limit value.
10. Delay Skew – This parameter shows the difference in propagation delay between the four wire pairs. The pair with the shortest propagation delay is the reference pair with a delay skew value of zero. Minimum test results documentation (summary results): Identify the wire pair with the worst-case propagation delay (the longest propagation delay). The report shall include the delay skew value measured as well as the test limit value.
11. PS ANEXT – Pair-to-pair Alien NEXT (ANEXT) contributions is measured by applying the stimulus signal at the near end to one wire pair of a disturbing link and measuring the coupled signal at the near end of a wire pair in a disturbed link. This process is repeated for every wire pair in a disturbing link. The PS ANEXT for each wire pair in a disturbed link is obtained by the power sum addition of all the pair-to-pair ANEXT results to that wire pair from all wire pairs in disturbing links. All the links that are bundles with the disturbed link need to be included as disturbing links. In addition, links that are terminated in adjacent positions in a patch panel or interconnect panel should also be included as disturbing links in this test. Minimum test results documentation (summary results): Identify the wire pair that exhibits the worst-case margin and the wire pair that exhibits the worst value for PS ANEXT. These wire pairs must be identified for the tests performed from each end. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.
12. PS AACR-F – The pair-to-pair Alien Far End crosstalk (AFEXT) contributions is measured by applying the signal at the near end to one wire pair of a disturbing channel or permanent link and measuring the coupled signal at the far end of a wire pair in a disturbed channel or permanent link. This process is repeated for every wire pair in a disturbing link and for

all links in close proximity. A normalization, which is dependent on the relative length of disturbing and disturbed link, is applied to each pair-to-pair alien FEXT measurement. Then the PS Alien Attenuation-to-Crosstalk Ratio from the Far end (PS AACR-F) for each wire pair in a disturbed channel or permanent link is obtained by the power sum addition of all the normalized pair-to-pair far end alien crosstalk results to that wire pair from all wire pairs in disturbing links in close proximity. Minimum test results documentation (summary results): Identify the wire pair that exhibits the worst-case margin and the wire pair that exhibits the worst value for PS AACR-F. if the link or channel connects two patch panels (data center), these wire pairs must be identified for the tests performed from both ends. Each reported case should include the frequency at which it occurs as well as the test limit value at this frequency.

Frequency Range (MHz)	Maximum Step size (MHz)
1 – 31.25	0.15
31.26 – 100	0.25
100 – 250	0.50
250 – 500	1.00

E. In addition to testing the “In-link” performance parameters detailed in D above, Alien Crosstalk testing or “Between-link’ testing shall be carried out in accordance with Section 4.7 of ANSI/TIA-1152. Alien crosstalk testing includes the PS ANEXT and PS AACR-F (Power sum alien attenuation-to-crosstalk ratio from the far end) performance parameters. The standards refer to the link-under-test for Alien Crosstalk as the disturbed link.

F. PS ANEXT and PS AACR-F shall meet or exceed the limits defined in Section 6 of the TIA Cat 6A Standard.

G. Selection of disturbed links: 1 % of the links in the cabling installation or 5 links, whichever is more. Chose short, medium and long links equally.

H. Selection of disturber links. Select all of the links that are in the same cable bundle and the most consistently positioned relative to the disturbed link as disturbing links.

I. If the margin of PS ANEXT and PS AACR-F exceeds 5 db for the first three short, medium and long links (nine in total), further alien crosstalk testing can be discontinued.

3.8 BACKBONE COPPER CABLE TESTING

A. Backbone Voice cables shall be free of shorts within the pairs, and be verified for continuity, pair validity and polarity and conductor position on the termination blocks. Any incorrectly positioned pairs must be identified and corrected. The percentage of “bad” pairs shall not exceed 3% in any backbone cable based on total pair count. All bad pairs must be identified and documented.

B. The Contractor shall be responsible to test the entire system from each voice outlet to the building Main Crossconnect (MC). If more than a 1% failure on the cross-connects occur the contractor will be required to provide mapping of the system.

3.9 FIBER OPTIC CABLE TESTING

A. Every fiber optic cabling link in the installation shall be tested in accordance with the field test specifications defined by the Telecommunications Industry Association (TIA) standard ANSI/TIA/EIA-568-B.

B. ANSI/TIA/EIA-568-B, defines the passive cabling network, to include cable, connectors, and splices, between two optical fiber patch panels. A typical horizontal link segment is from the telecommunications outlet/connector to the horizontal cross-connect. The test shall include the representative connector performance at the connecting hardware associated with the mating of patch cords. The test does not, however, include the performance of the connector at the interface with the test equipment.

C. 100% of the installed cabling links shall be tested. Any failing link must be diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements. The final and passing result of the tests for all links shall be provided in the test results documentation.

D. Trained technicians who have successfully attended an appropriate training program and have obtained a certificate as proof thereof shall execute the tests. These certificates may have been issued by the manufacturer of the fiber optic cable and/or the fiber optic connectors or the manufacturer of the test equipment used for the field certification.

E. Field test instruments for multimode fiber cabling shall meet the requirements of ANSI/TIA/EIA-526-14A. The light source shall meet the launch requirements of ANSI/EIA/TIA-455-50B, Method A. This launch condition can be achieved either within the field test equipment or by use of an external mandrel wrap with a Category 1 light source.

F. Field test instruments for single mode fiber cabling shall meet the requirements of ANSI/EIA/TIA-526-7.

G. The tester shall be within the calibration period recommended by the vendor in order to achieve the vendor-specified measurement accuracy.

H. The fiber optic launch cables and adapters must be of high quality and the cables shall not show excessive wear resulting from repetitive coiling and storing of the tester interface adapters.

I. A Pass or Fail result for each parameter is determined by comparing the measured values with the specified test limits for that parameter. The Pass or Fail condition for the link-under-test is determined by the results of the required individual tests.

J. ANSI/TIA/EIA standard 568-B prescribes that the single performance parameter for field testing of fiber optic links is insertion loss. The insertion loss shall be calculated by the following formulas specified in ANSI/TIA/EIA standard 568-B:
   1. Link Attenuation = Cable_Attn + Connector_Attn + Splice_Attn
   2. Cable_Attn (dB) = Attenuation_Coefficient (dB/km) * Length (Km)
   3. The values for the Attenuation_Coefficient are listed in the table below:

Type of Optical Fiber	Wavelength (nm)	Attenuation Coefficient (dB/km)
Multimode 50/125 µm	850	3.0
	1300	1.0
Single-mode (Inside plant)	1310	0.5

	1383	0.5
	1550	0.5
Single-mode (Outside plant)	1310	0.5
	1383	0.5
	1550	0.5

4. Connector_Attn (dB) = number_of_connector_pairs * connector_loss (dB)
5. Maximum allowable individual connector_loss = 0.75 dB
6. Splice_Attn (dB) = number of splices (S) * splice_loss (dB)
7. Maximum allowable splice_loss = 0.3 dB

K. Additional 40GB/100GB requirements for multimode fiber:
1. Maximum MPO and individual connector loss = .35 dB
2. Maximum total connector loss per 150 meters = 1 dB
3. Maximum total channel insertion loss per 150 meters = 1.5 dB

L. Link attenuation does not include any active devices or passive devices other than cable, connectors, and splices, i.e., link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.

M. Link test limits attenuation are based on the use of the One Reference Jumper Method specified by ANSI/TIA/EIA-526-14A, Method B and ANSI/TIA/EIA-526-7, Method A.1

N. The acceptable link attenuation for a multimode horizontal optical fiber cabling system is based on the maximum 90 m (295 ft) distance. The horizontal link should be tested at 850 nm or 1300 nm in one direction in accordance with ANSI/EIA/TIA-526-14A, Method B, One Reference Jumper. The horizontal link shall be tested using a fixed upper limit for attenuation of 2.0 dB.

O. Multimode backbone links shall be tested in one direction at 850 nm and 1300 nm in accordance with ANSI/EIA/TIA-526-14A. The link attenuation equation above shall be used to determine limit values.

P. Single mode backbone links shall be tested at 1310 nm and 1550 nm in accordance with ANSI/TIA/EIA-526-7, Method A.1, One Reference Jumper. All single mode links shall be certified with test tools using a Category 2 laser light sources at 1310 nm and 1550 nm.

3.10 COAX CABLE TESTING

A. A Time Domain Reflectometer (TDR) shall be used to verify cable length and to test for cable faults and breaks. A step-function high resolution Time Domain Reflectometer shall be employed for this test. The TDR will sweep the cable at a rate no greater than 50' per second, or such lower rate as necessary to resolve cable faults to the 1" and .001 VRC level.

B. The cables shall be terminated with its characteristic impedance, and in the case of nominal 75 ohm cable, an appropriate matching pad shall be used to match the analyzer to the cable. Cable shall be rejected if any single fault is observed of amplitude greater than .003 voltage reflection coefficient. Characteristic impedance shall also be measured at 5% of nominal value.

C. Cyclic faults (such as cable reel stress and die drawdown) shall be limited to a voltage reflection coefficient of .005.

D. The signal level at each outlet/drop should have minimum of 6 dBmV and a maximum of 15 dBmV on all channels.

3.11 WARRANTY

A. The Contractor shall guarantee all materials, equipment, etc., for one year from date of substantial completion of this work. This guarantee shall include all labor, material and travel time. This warranty is in addition to the cabling system manufacturer's warranty.

END OF SECTION

SECTION 27 11 00 -COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end structured cabling system. Including equipment for the Telecom Rooms.

1.2 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NEC, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.3 RELATED DOCUMENTS

A. General and Supplementary Conditions

1.4 RELATED SECTIONS

A. Division 26 - Grounding and Bonding

B. Division 27 - Communications

PART 2 - PRODUCTS

2.1 Manufacturer(s) And Solutions

A. Acceptable equipment rack, cabinet and cable management and accessory manufacturers:
1. Chatsworth Products Inc.
2. Panduit
3. Hoffman
4. Or equal subject to review.

2.2 4-POST EQUIPMENT CABINET

A. The 4-post floor-mounted 19” Rack: Aluminum or steel construction, freestanding, modular, with top and bottom angles.

B. Rack shall be 84" high and accommodate industry standard 19” wide mounting brackets.

C. Rack shall incorporate a universal 5/8"-5/8"-1/2"alternating hole pattern.

D. Rack rails shall be threaded and tapped to accept industry standard #12-24 mounting screws.

E. Rack should be supplied with a ground bar and #6 AWG Ground lug.

F. Equipment Rack shall be equipped with cable management hardware to provide for orderly and secure routing of cabling. Provide cable management as described in the specifications and drawings.

2.3 HORIZONTAL CABLE MANAGEMENT

A. Horizontal cable manager shall be slotted duct with removable cover. Manager shall be a minimum of 2 rack units high and suitable for mounting in a standard 19” wide rack.

B. Provide strain relief and cable management at the rear of each manager unit for clean routing of all cables.

C. Management shall be Black in color.

2.4 VERTICAL CABLE MANAGEMENT

A. Vertical cable manager shall be slotted duct with removable cover. Wires should be held in place after cover is removed. Finger spacing for front side shall be on 1U centers. Manager shall have integral cable pass thru holes for ease of front to back cabling. Management shall be provided for front and back of rack.

B. Management shall be side mounted on both sides of each equipment rack as shown on the drawings.

C. The back side of management shall include adjustable rear cable rings with spin-open latches. Spacing between rings from top to bottom should not impede in bundling and passing of cable groups.

D. The front side of the management shall feature a minimum of 7.5 in. depth or 37 sq. in. of usable area. The rear side of the management shall feature a minimum of 6.8 in. depth or 39.4 sq. in. of usable area.

E. Height of management shall match overall height of rack and have a minimum 6 in. width.

F. Contractor shall review and confirm the vertical management capacity with the amount of cables being terminated prior to product submission.

G. Management shall be Black in color.

2.5 LADDER CABLE RUNWAY

A. Cable runway shall be ladder type and designed for use in telecommunications rooms.

B. Cable runway shall be aluminum construction, minimum 12” wide and 1.5” side rails.

C. Provide all parts and pieces to create a continuous pathway for cables within telecommunication rooms. Provide parts to support cable continuously from the sleeves entering the TR to the equipment racks and backboards.

D. Finish should be powder coated, black.

2.6 TELECOMMUNICATIONS PLYWOOD BACKBOARD

A. Backboards shall be 4'W x 8'H x ¾"D.

B. Finished grade of A-C or better. A-side shall face the interior of the room.

C. All sides of each backboard should be finished with (2) coats of white paint prior to installation. Plywood grade and fire rating stamps on plywood shall remain exposed and not painted over.

D. If the walls where plywood backboard will hang are fire rated or there's a requirement for fire rating per codes, the plywood backboard and finish paint must meet the same fire rated requirements.

E. A fire retardant paint additive may be used and the associated documentation should be applied to the painted backboard as proof of usage.

2.7 POWER DISTRIBUTION UNIT (PDU)

A. PDU inlet cord shall include the appropriate plug deemed necessary (e.g. 5-20P/5-30P/L6-30P) per the electrical drawings. Refer to the electrical drawings for more information on plug type for dedicated power receptacles above the equipment racks and cabinets or elsewhere in the room.

B. Horizontally mounted PDUs shall include a minimum of (8) NEMA 5-15R/5-20R power sockets on the back side for equipment connections. PDUs shall be horizontally mounted with no more than 1 rack unit in height.

C. Vertically mounted PDUs for equipment cabinets or 4-post racks should include a minimum of (21) C13 and (3) C19 power sockets for equipment connections. PDUs shall be mounted vertically at the back of the rack.

D. Inlet cord on PDU shall be a minimum 12 feet in length.

E. PDUs shall be switched and functionality to be metered by individual outlet.

F. Each outlet on PDU shall support power-on, power-off and reboot on a real-time programmable basis.

G. Unit shall allow reporting of voltage, frequency & load level, and current via Ethernet interface. Notifications of conditions are to be reported by email, secure web, SNMP, Telnet or SSH interface.

H. PDU shall provide Transient suppression to avoid overloads per the wattage rated by the PDU overall and by the individual power outlets.

I. UL-1449, UL 1283 and UL-497A compliant.

J. Power strip shall meet or exceed IEEE 587 Category A & B specifications.

K. Provide (1) horizontally mounted PDU shall be furnished and installed within each 2-post rack and equipment cabinet or 4-post rack.

L. Provide (1) vertically mounted PDU shall be furnished and installed within each equipment cabinet or 4-post rack.

PART 3 - EXECUTION

3.1 EQUIPMENT RACK

A. The Contractor shall bolt the rack to the floor as recommended by the manufacturer. Multiple racks shall be joined and the ground made common on each. Rack shall also be stabilized by extending a brace to the wall. Alternately, overhead cable tray over which the cabling accesses the equipment rack(s) shall provide this function.

B. Provide minimum clearances as shown on Drawings. Locations where these guidelines cannot be followed should be brought to the attention of the Consultant prior to installation.

C. Install with a minimum of 36 inches clear access behind and in front of rack unless otherwise directed by drawings.

D. Install racks straight and perpendicular to walls.

E. All hardware and equipment shall be mounted above 18" and below 79" A.F.F.

F. The rack shall be grounded to the telecommunications ground bar (TGB) using a minimum #6 AWG insulated stranded copper conductor. Conductor jacket shall be green.

3.2 WIRE MANAGEMENT

A. Rack shall be equipped with vertical and horizontal wire management hardware.

B. Provide vertical cable management hardware on front and rear of each rack. Where multiple racks are installed, troughs shall be mounted between the uprights of adjacent racks per manufacturer recommendations.

3.3 LADDER CABLE RUNWAY

A. Provide dropouts at all equipment rack and backboard locations.

B. Install straight, level and perpendicular to walls and ceiling.

C. Install 3” to 6” above racks.

D. Cables shall be secured to the runway using reusable cable ties to arrange cable in logical bundles.

E. Ground cable runway according to manufacturer’s written instructions

3.4 BACKBOARDS:

A. Install backboards 6” above the finished floor to 8’6” AFF. Mounting shall be sufficient enough to support the equipment.

B. Shall be mounted with a minimum of 3/8” toggle bolts and 2” fender washer on each corner and 4’ on center as required.

END OF SECTION

SECTION 27 13 00 - COMMUNICATIONS BACKBONE CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end backbone structured cabling system throughout the campus and premises. This includes - but is not limited to - furnishing and installing cable, cable supports, cable ties, innerduct and termination components, ancillary equipment, testing, labeling and documentation of cables and connectors.

B. Complete product procurement and installation shall comply with the campus or owner’s latest telecommunication and Information Technology standards documents.

PART 2 - PRODUCTS

2.1 Manufacturer(s) And Solutions

A. Acceptable fiber optic cabling & component (interbuilding and intrabuilding) manufacturers:
1. Corning
2. Commscope
3. Panduit
4. Or equal subject to review.

2.2 Basic Environmental Requirements

A. Cabling shall be suitable for environment in which they are to be installed.

B. Cabling shall be plenum-rated within interior premise installations.

C. Cabling shall be outdoor rated within exterior installations subject to outdoor environmental conditions.

2.3 INTRABUILDING FIBER OPTIC CABLE

A. This cable shall be suitable for indoor installation in free-air, conduit, tray and/or in innerduct. Cable shall carry on OFNP rating.

B. Cable materials shall be all dielectric.

C. Outer sheath shall be marked with the manufacturer's name, date of manufacture, fiber type, flame rating, UL symbol, and sequential length markings every two feet. All coatings shall be mechanically strippable without damaging the optical fiber.

D. The glass fiber shall be doped silica core surrounded by a concentric glass cladding. The fiber shall have a graded index. The overall cladding diameter shall be $125 \pm 2\mu m$.

E. Multi-mode optical fibers in each cable shall meet the following specifications:
   1. Transmission Windows 850nm, 1300nm, and minEMBc (Laser)
   2. Core Diameter 50.0 ± 3μm
   3. Maximum Attenuation 3.0 dB/km @ 850nm; 1.0 dB/km @ 1300nm
   4. Minimum Bandwidth 3500 MHz/km @ 850nm
      500 MHz/km @ 1300nm
      4700 MHz/km @ minEMBc (Laser)
   5. Fiber Classification OM4

F. Single-mode optical fibers in each cable shall meet the following specifications:
   1. Transmission Windows 1310nm, 1383nm and 1550nm
   2. Core Diameter 8.3μm
   3. Maximum Attenuation 0.5 dB/km @ 1310nm
      0.5 dB/km @ 1383nm
      0.5 dB/km @ 1550nm
   4. Fiber Classification OS2

2.4 INTERBUILDING FIBER OPTIC CABLE

A. Cable shall be suitable for direct burial or duct applications.

B. Cable shall incorporate a corrugated steel armor tape to provide rodent resistance. Other cable materials shall be all dielectric.

C. Cable shall be constructed with a dry or gel-filled water-blocking material.

D. Cable shall be of loose tube construction.

E. Outer sheath shall be polyethylene (PE).

F. The outer sheath shall be marked with the manufacture name, words identifying the cable as fiber optic cable, and sequential length markings. The marking shall be in a contrasting color to the cable jacket.

G. Quantity and type of standards shall be as indicated on the drawings.
   1. Transmission Windows 850nm, 1300nm, and minEMBc (Laser)
   2. Core Diameter 50.0 ± 3μm
   3. Maximum Attenuation 3.0 dB/km @ 850nm; 1.0 dB/km @ 1300nm
   4. Minimum Bandwidth 3500 MHz/km @ 850nm
      500 MHz/km @ 1300nm
      4700 MHz/km @ minEMBc (Laser)
   5. Fiber Classification OM4

H. Single-mode optical fibers in each cable shall meet the following specifications:
   1. Transmission Windows 1310nm, 1383nm and 1550nm
   2. Core Diameter 8.3μm
   3. Maximum Attenuation 0.5 dB/km @ 1310nm
      0.5 dB/km @ 1383nm
      0.5 dB/km @ 1550nm
   4. Fiber Classification OS2

2.5 INDOOR/OUTDOOR FIBER OPTIC CABLE

A. Cable shall be provided wherever it shall run within a wet environment or where it would be exposed to an outdoor condition.

B. Cable shall be suitable for installation both indoors and outdoors.

C. Cable shall retain an OFNP plenum rating to meet the listing requirements per NFPA for use within building premises.

D. Cable shall be loose tube construction.

E. Cable shall be constructed with a dry of gel-filled type water blocking material.

2.6 FIBER OPTIC TERMINATION PANELS

A. All fibers shall be terminated on Duplex-LC couplings mounted on enclosed patch panels. Couplers shall be mounted on a panel that snaps into the enclosure.

B. The enclosure shall be designed to accommodate a changing variety of connector types by changing panels on which connector couplings are mounted.

C. The panel enclosure shall be sized to accommodate the total quantity of fiber strands as described in the specifications and drawings.

D. Termination panels shall be enclosed assemblies. The enclosures shall incorporate a hinged or retractable front cover designed to protect the connector couplings and fiber optic jumpers.

E. The patch panel enclosure shall provide for strain relief of incoming cables and shall incorporate radius control mechanisms to limit bending of the fiber to the manufacturers recommended minimums.

F. Access to the inside of the patch panel enclosure during installation shall be from the front and rear.

G. The patch panel enclosure shall be configured to require only front access when patching. The enclosure shall provide a physical barrier to access of backbone cables.

H. The enclosure shall incorporate a storage cassette, tray, or other mechanism designed to allow identification, access and termination of individual fibers.

I. The fiber optic patch panel shall be rated to match or exceed the ANSI/TIA/EIA rated wiring terminated on the panel.

2.7 FIBER OPTIC CONNECTOR

A. The Optical Connector shall be Duplex-LC type modular jack. Completed cable assembly shall interface with fiber optic terminal bulkhead feed-through receptacle on Fiber Optic Patch Panel. Supply and install dust caps for terminated fibers.

B. The connector ferrule shall be ceramic. The optical fiber within the connector ferrule shall be secured with an adhesive [or mechanical connection].

2.8 FIBER OPTIC PATCH CORDS

A. The fiber optic patch cables shall match the core size and type of fiber being patched. The fiber optic patch cables shall utilize tight buffer construction.

B. Fiber Optic jumpers shall incorporate connectors that match the terminations of the fiber being patched. Connector body shall be of materials similar to that used in the proposed couplings.

C. Provide patch cords with connectors compatible with equipment being patched. Verify connector type of active electronic equipment with owner.

D. Provide one optical fiber patch cord per optical fiber strand installed.

E. For the TR patch cords, 80% shall be 3 meters, 10% shall be 4 meters and 10% shall be 7 meters in length from the total number.

PART 3 - EXECUTION

3.1 FIBER OPTIC CABLE

A. Cable shall be continuous and free of splices except in specified splice trays in TR or ER locations. Factory optical fiber splices are not allowed.

B. The fiber manufacturer shall subject all fibers to a minimum tensile proof test equivalent to 100-kpsi. All fibers in each cable shall be guaranteed to meet the stated specifications.

C. Backbone intra-building fiber optic cabling shall be installed via conduit and/or in innerduct in cable tray as illustrated on the drawings.

D. Provide 15 feet of slack in each backbone fiber optic cable. The cable slack shall be coiled and stored in a location to protect it from damage in the TR or ER in the case of inter-building cables. The slack shall be stored in a separate enclosure designed for this purpose. Multiple cables may share a common enclosure.

E. Maintain bending radius of twenty times the outside diameter of the cable during installation and ten times the outside diameter with no load.

F. Backbone Fiber Optic Cable shall be installed in protective innerduct where cable is susceptible to damage. This includes areas cable tray and transitions between pathways. The innerduct should extend into the termination and/or storage enclosure(s) at system endpoints.

3.2 FIBER OPTIC CONNECTOR

A. The fiber optic connector shall be installed per manufacturer’s written instructions.

3.3 FIBER OPTIC PATCH PANEL

A. Fiber optic patch panels shall be rack mounted.

B. Install fiber optic patch panels in topmost rack position.

C. Transition outdoor to indoor cables either by splicing factory-terminated pigtails or by the use of a "fan-out" kit. Secure individual fibers in an aramid reinforced tube.

D. Termination hardware shall incorporate a mechanism to secure cable and sub-assemblies and prevent damage.

E. Splicing shall be by the “fusion” method.

F. Direct termination of 250 µm coated fibers shall not be permitted.

3.4 FIBER OPTIC PATCH CORDS

A. The fiber optic patch cords shall be installed per manufacturer’s written instructions.

B. Contractor must coordinate with the owner for installing all patch cords within the TR.

C. Any left-over patch cords which are not used for the initial installation shall be placed in a box and handed over to the owner. Patch cords must be new and within the original unopened package.

END OF SECTION

SECTION 27 15 00 - COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end horizontal structured cabling system throughout the campus and premises. This includes - but is not limited to - furnishing and installing cable, cable supports, cable ties, innerduct and termination components, ancillary equipment, testing, labeling and documentation of cables and connectors.

B. Complete product procurement and installation shall comply with the campus or owner’s latest telecommunication and Information Technology standards documents.

PART 2 - PRODUCTS

2.1 Manufacturer(s) And Solutions

A. Acceptable indoor/premise end to end solutions for horizontal Category 6A copper and components:
1. Siemon Z-MAX 6A
2. Commscope Systimax 360 GigaSPEED X10D
3. Panduit / General GenSPEED 10
4. Or equal subject to review.

2.2 Basic Environmental Requirements

A. Cabling shall be suitable for environment in which they are to be installed.

B. Cabling shall be plenum rated within interior premise installations.

C. Cabling shall be outdoor rated within exterior installations subject to outdoor environmental conditions.

2.3 HORIZONTAL STATION CABLE

A. Cable shall consist of 4 pair #23 AWG insulated solid copper conductors. Each pair shall be unshielded and twisted.

B. Transmission characteristics of the cables shall exceed Category 6A performance as defined by industry standards.

C. The jacket color for communication cables shall be Blue.

2.4 INDOOR JACKS

A. Jacks shall be non-keyed 8-pin 8 conductor (8P8C) modular jacks.

B. Data termination hardware shall meet full Category 6A performance specifications as defined by industry standards.

C. Jacks shall be UL verified and listed.

D. Color of the communication jack shall be Blue.

2.5 TELECOM OUTLET - STANDARD INDOOR

A. The combined faceplate and connector jack assembly is referred to as the Information Outlet (IO).

B. Connector assemblies shall utilize modular jacks as specified in Paragraph 2.4.

C. Outlet faceplates shall incorporate recessed designation strips for identifying labels. Designation strips shall be fitted with clear plastic covers.

D. The faceplate of the IO shall be constructed of high impact plastic (except where noted otherwise).

E. Single-gang faceplates shall be 2.75 x 4.5 inches.

F. Faceplates shall be UL listed.

G. Color of the wall plate shall be Ivory or White depending on electrical outlet color to match.

2.6 TELECOM OUTLET - WALL PHONE

A. Faceplate shall be stainless steel flush to utilize a single modular jack.

B. Faceplate shall have standard mounting stubs on top and bottom suitable for wall mounting a standard phone directly over it.

C. Outlet shall be placed at a location providing 12” x 12” clearance at all sides to accommodate the phone.

2.7 TELECOM OUTLET - MODULAR FURNITURE

A. Outlet module shall be formulated to fit all jacks in row for use within furniture cabling provision or raceway. Contractor must confirm compatibility of outlet with the raceway manufacturer prior to ordering.

B. Outlet module shall allow jacks to retain the configuration of the standard information outlets shall accommodate easy to read labels configured horizontally.

C. Color of the outlet module should be Ivory or White depending on electrical outlet color to match.

2.8 TELECOM OUTLET - FLOORBOX/POKE-THRU

A. Faceplate shall include mounting slots for accommodating required jacks within the floorbox/poke-thru. Contractor must confirm compatibility of faceplate with the floorbox/poke-thru

B. Faceplate shall be able to fit within standard NEMA provision as well as low voltage floorbox and poke-thru provisions.

C. Color of the faceplate shall be Ivory or White depending on electrical outlet color to match.

2.9 TELECOM OUTLET - RACEWAY

A. Outlet module shall be formulated to fit all jacks for use within the raceway's provisions. Contractor must confirm compatibility of outlet with the raceway manufacturer.

B. Outlet module shall allow jacks to retain the configuration of the standard information outlets shall accommodate easy to read labels configured horizontally.

C. Color of the outlet module should be Ivory or White depending on electrical outlet color to match.

2.10 HORIZONTAL STATION CABLE PATCH PANEL

A. The data patch panel shall utilize modular jacks as described in Paragraph 2.4.

B. Patch panels shall be 19" wide and rack mounted.

C. Individual patch panels shall contain a maximum of 48 ports.

D. Patch panels shall be angled patch panel, universal.

E. The data patch panel as a system shall be rated to match or exceed the ANSI/TIA/EIA rated wiring terminated on the panel.

F. Patch panel shall be complete with rear strain relief mechanism for the incoming cables.

G. The patch panel shall have integral designation strips to identify each port on the front and rear of the panel.

H. Patch panels shall have a minimum of 20% spare ports.

2.11 COMMUNICATIONS INDOOR OUTLET PATCH CORDS

A. Patch cords shall be factory manufactured by the same manufacturer providing the horizontal cabling and meet the requirements of Category 6A cabling.

B. Be round, and consist of eight insulated 23 AWG, stranded copper conductors, arranged in four color-coded twisted pairs within a flame-retardant jacket.

C. Be equipped with modular 8-position plugs on both ends, wired straight through with standards compliant wiring.

D. Furnish one patch cord per installed jack at workstation and TR room.

E. Patch cord lengths must not exceed the maximum allowed for proper operation per Manufacturer’s requirement or specifications.

F. Install the quantity of patch cords in coordination with network deployment with owner.

G. All workstation patch cords shall be 14 feet in length.

H. For the TR patch cords, 80% shall be 7 feet, and 20% shall be 14 feet in length from the total number.

PART 3 - EXECUTION

3.1 HORIZONTAL DATA STATION CABLE AND TERMINATIONS

A. All horizontal Data Station Cables shall terminate on modular patch panels in their respective Telecommunications Rooms (TR) or Equipment Room (ER) as specified on the drawings.

B. The maximum station cable drop length shall not exceed 90-meters. This length shall be measured from the patch panel in the wiring closet to the outlet in the work area. The Contractor is responsible for installing station cabling in a fashion to avoid runs that exceed this distance. Any areas that violate the above constraints shall be identified and reported to the Consultant prior to installation.

C. All cables shall be continuous and splice-free.

D. During pulling operation provide adequate resources to observe cable at all points of duct entry and exit.

E. Avoid abrasion and other damage to cables during installation.

F. All cable shall be installed free of tension at both ends. In cases where the cable must bear some stress, Kellom grips may be used to spread the strain over a longer length of cable.

G. Cables shall be supported according to applicable codes. J-hooks used for cable support shall be manufactured solely for the purpose of supporting communication cables.

H. Supports should be spaced at a maximum 4-foot interval unless limited by building construction. If cable "sag" at mid-span exceeds 12-inches, another support shall be used.

I. Cable shall never be supported by the ceiling grid.

J. Cables shall not be attached to existing cabling, plumbing or steam piping, ductwork, ceiling supports or the outside of existing electrical or communications conduit.

K. Manufacturer’s minimum bend radius specifications shall be observed at all times. Cable ties should not be over tightened as to compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.

L. Cable sheaths shall be protected from damage by sharp edges. Where a cable passes over a sharp edge, a bushing or grommet shall be used to protect the cable. Bushings shall be used at both ends of all EMT and rigid steel conduit.

M. Maintain the following minimum separation distances between power and data cables.

Condition	Minimum Separation Distance		
	< 2kVA	2-5 kVA	>5kVA
Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways	5”	12”	24”
Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway	2.5”	6”	12”
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway		3”	6”
Electrical motors and transformers			48”

N. Maintain the following minimum separation distances between data cables and specific electromagnetic interference sources:

Source of Disturbance	Minimum Separation
Fluorescent lamps	5”
Neon lamps	5”
Mercury vapour lamps	5”
High-intensity discharge lamps	5”
Arc welders	31”
Frequency induction heating	39”

O. Cables shall be routed through channel in modular furniture. Communication cabling shall not run in channel with power wiring.

P. Information Outlets shall be flush mounted on wall-mounted boxes, in floor-mounted boxes, and in modular furniture as shown on Drawings.

Q. All data and voice cables shall be positioned on termination hardware in sequence of the Outlet I.D. starting with the lowest number.

R. Termination hardware (Blocks and Patch Panels) positioning and layout must be reviewed by the Consultant prior to construction. The review does not exempt the Contractor from meeting any of the requirements stated in this document.

S. Patch panels shall be installed to allow for future cables to be added without disrupting existing installation.

T. Cables shall have a 12” service loop in outlet box or supported properly above ceiling.

3.2 JACKS

A. Jacks shall be wired per TIA-568A pin outs.

3.3 INFORMATION OUTLET

A. The same orientation and positioning of jacks and connectors shall be utilized throughout the installation.

B. Outlet boxes shall be secured to building with minimum of two mechanical fasteners per box. Adhesive fasteners are not allowed.

C. All extra openings to be filled with blank inserts.

3.4 COMMUNICATIONS PATCH PANEL

A. Panels shall be fully populated with jacks.

3.5 HORIZONTAL DATA STATION CABLE PATCH CORDS

A. The patch cords shall be installed per manufacturer’s written instructions.

B. Contractor must coordinate with the owner for installing all patch cords within the TR.

C. Any left-over patch cords which are not used for the initial installation shall be placed in a box and handed over to the owner. Patch cords must be new and within the original unopened package.

END OF SECTION

27 51 26 – ASSISTIVE LISTENING SYSTEMS

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The work includes the provision of Assistive Listening Systems (ALS) as part of the building project.

B. Fixed Assistive Listening Systems (ALS) as part of the building project.

C. Scope of Work: The work shall consist of the design, provision, termination, testing, and documentation of a complete and fully functional ALS. The instructions in this section are specific to the ALS installations and should be read in conjunction with other contract documents as applicable.

1.2 REGULATORY REFERENCES

A. ALS equipment provided per this Section shall be in full compliance with the requirements of the Americans with Disabilities Act and as needed for the facility to meet full compliance.

B. ALS System shall be provided in accordance with CBC Section 11B-219 and shall comply with CBC Section 11B-706.

C. The minimum number of receivers to be provided shall be equal to 4% of the total number of seats, but in no case less than two. 25% minimum of the receivers provided, but no less than two, shall be hearing aid compatible in accordance with CBC Section 11B-706.3.

D. If the system provided is limited to specific areas or seats, then such areas or seats shall be within a 50-foot viewing distance of, and have a complete view of, the stage or playing area. CBC Section 11B-219.4.

1.3 PRE-INSTALLATION MEETINGS

A. Pre-installation conference: Not applicable

1.4 SUBMITTALS

A. Prior to ordering materials or commencing any construction activities, the contractor shall provide the Owner with a complete bill of materials, including all quantities of components, devices, equipment, and wiring required to complete this work.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

C. Preparation instructions and recommendations

D. Storage and handling requirements and recommendations.

E. Manufacturer's installation, operation, maintenance, and cleaning instructions

F. Shop Drawings: Indicate fabrication and installation details, electric wiring diagrams, product list including manufacturers, models, and quantities.

G. Submit proof of qualifications specified in the “Quality Assurance” paragraph

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications

B. Manufacturer with 10 years minimum successful experience manufacturing Assistive Listening Systems.

C. Manufacturer whose product offerings include all components and accessories needed to execute fully functional ALS systems that satisfy CBC and ADA requirements for each space

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, per Applicable Code Requirements

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits

1.8 WARRANTY

A. Warranty

B. Warranty Period: One (1) year from date of Substantial Completion or the manufacturer’s stated product warranty, whichever is greater

PART 2 - PROUCTS

2.1 INSTALLATION

A. Listen Technologies

B. Or equal

2.2 PRODUCT REQUIREMENTS

A. Basis of Design: Listen Technologies

B. Items specified are to establish a standard of quality for design, function, materials, and appearance.

C. Type A – Fixed System
   1. The full complement of equipment provided shall constitute a complete system of compatible components as produced by a single manufacturer. A mix of components by multiple manufacturers shall be unacceptable.
   2. The assistive listening system (ALS) shall be capable of broadcasting on 57 channels and be frequency agile. The ALS system shall have 80dB SNR or greater, end-to-end. Receivers shall be frequency agile and frequency set with a "seek" button. The receiver will incorporate a stereo headset jack that allows the user to plug in either a mono or stereo headset and listen to audio normally. The portable receivers and transmitters shall incorporate automatic battery charging circuitry for recharging of Ni-MH batteries
   3. Equipment for (1) system in Community Room:
      a. Listen Technologies LT-800-72-01 57-Channel base station (Qty: 1), or equal
      b. Listen Technologies LR-4200-072 Portable Display receiver (Qty: 8), or equal
      c. Listen Technologies LA-123 ALS Antenna (Qty: 1), or equal
      d. Listen Technologies LA-404 Ear Speaker (Qty: 2), or equal
      e. Listen Technologies LA-430 Neck Loop (Qty: 2), or equal
      f. Listen Technologies LA-365 NiMH rechargeable batteries. (Qty: 2), or equal
      g. Listen Technologies LA-381-01 12-Unit Charging/Carrying Case (Qty: 1), or equal
      h. Cabling to support proper coverage for each system.

PART 3 - EXECUTION

A. EQUIPMENT INSTALLATION
   1. All specified ALS equipment and original system documentation, including owner’s manual, installation instructions, and system programming manuals, shall be delivered to the Owner in original unopened packaging for installation and/or deployment by others.
   2. All specified fixed ALS system shall be installed in accordance with the Audio Visual systems requirements by the AV integrator

END OF SECTION

SECTION 26 16 00 - INTRUSION ALARM SYSTEM

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. All applicable portions of Division 26 shall apply to this section as though written herein completely.

B. The work under this section includes all labor, materials, equipment, and accessories required to furnish and install a complete Integrated Intrusion Alarm System as indicated on the drawings and as specified herein. The System shall contain integrated into the following Subsystems: Telephone and Fire Alarm systems Interface.

1.2 RELATED WORK

A. Document affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and sections of Divisions 1 and 26 of these specifications.

B. The work described by this part includes the furnishing of all materials, equipment, supplies, labor and the performing of all operations necessary for the installation of complete and operating systems.

C. All conduits, outlet boxes, back boxes, junction boxes, terminal cabinets, backboards, wiring, cables, equipment, devices, etc., shall be furnished and installed complete under this section. Conduit and junction box sizes shall be determined by the Installing Communications Contractor for the particular wire and cable fills required for the systems installed. (Conduit sizes shall comply with the California Electrical Code). The entire responsibility of the system, including the installation, operation, function, testing and maintenance for one (1) year after final acceptance under this section shall be the responsibility of the communications contractor.

D. The Installing Intrusion Alarm Contractor shall furnish and install all equipment, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.

1.3 GENERAL REQUIREMENTS

A. The Installing Communications Contractor shall hold a valid State of California C-10 License, shall have completed at least 20 projects of equal scope, shall have been in business of furnishing and installing communication systems of this type for at least five years, and capable of being bonded to assure the owner of performance and satisfactory service during the guarantee period.

B. The Installing Communications Contractor shall hold all other licenses required by the legally constituted authorities having jurisdiction over the work. Such as Alarm Company and Agent licenses.

C. The Installing Communications Contractor shall be a factory authorized distributor and warrantee station for the brand of equipment specified and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. The Installing Communication Contractor shall maintain a spare set of all major parts for the system at all times. All circuit boards and control sub systems shall be 100% backed up with stock at contractor's shop.

1.4 QUALITY ASSURANCE

A. In order to match the District's Standard, establish quality and standards of performance the specified equipment for the Intrusion alarm system is that of Bosch Corporation. All mechanical, electrical and general information set forth on the respective data sheets for each specified item shall be considered to be part of these specifications and binding herein. Any proposed equal item offered shall be substantiated fully to prove equality. A list of at least six jobs of the identical equipment that has been in service for at least three years must be submitted with telephone numbers and addresses. The Architect reserves the right to require a complete sample of any proposed equal item and may, if necessary, request a sample tested by an independent testing laboratory to prove equality. The decision of the Architect regarding equality of proposed equal items will be final.

B. It is the intent of these specifications to establish a standard of quality for labor and material to be installed. The Base Bid shall include materials as specified without exception. For any proposed substitution, complete descriptive, technical and cost comparison data and test reports shall be submitted for review during the bidding period. The Contractor shall reimburse the Architect for any additional engineering charges and shall pay all charges of other trades resulting from substitutions. Proposed substitutions shall be listed on the bid form, stating the reasons for substitution and the amount to be deducted from the bid if the substitution is allowed. Final approval of the alternate system shall be determined at the time of job completion. Failure to provide the "precise functional equivalent" shall result in the removal of the alternate system and installation of the specified system at the contractor's expense.

C. If a substitution item is given final acceptance by the Owner, the contractor shall pay all costs (including travel, lodging, meals, computers, etc.…) required to provide factory certification, equal to that of a Factory Authorized Distributor of the substituted item, for two (2) selected Owners representatives. This training shall occur at the primary factory of the substituted item in question and shall allow the selected Owners representatives to provide any and all Factory / Manufacturer approved repairs, services, software upgrades, etc… without affecting any available or applicable Manufacturer Warranties.

D. All of the Electronic Systems Equipment shall be furnished and installed by the Authorized Factory Distributor of the equipment. The Contractor shall furnish a letter from the manufacturer of all major equipment, which certifies that the Installing Communication Contractor is the Authorized Distributor and that the equipment has been installed according to factory intended practices. The Contractor shall also furnish a written guarantee from the manufacturer that they will have a service representative assigned to this area for the life of the equipment.

E. All communication systems supplied shall be listed by Underwriter's Laboratories under UL Standard 1459. A copy of the UL listing card for the proposed system shall be included with the contractor's submittal.

F. The material in this section will be covered by the Bosch five year material warranty policy.

1.5 SUBMITTAL AND MANUALS

A. Comply with all requirements of the General Conditions, Supplementary Conditions and applicable sections of Divisions 1 and 26 of these specifications.

B. Additional requirements of this section are:
1. Within thirty-five (35) calendar days after the date of award of the Contract, the Contractor shall submit to the Architect for review, eight copies of a complete submission.
2. The submission shall consist of five major sections with each section separated with index tabs. Each page in the submission shall be numbered chronologically and shall be summarized in the index.
3. The first section shall be the "Index" which shall include the project title and address, name of the firm submitting the proposal and name of the Architect.
4. The second section shall include a copy of the Installing Communication Contractors valid C-10 California State Contractors License, letters of factory authorization and guaranteed service, list of 20 projects of equal scope and list of proposed instrumentation to be used by the Contractor.
5. The third section shall contain the comparative specification listing, including a complete listing of the characteristics of the equipment to be furnished next to all of the specified equipment's features and functions as stated in the specifications and data sheets.
6. The fourth section shall contain an original factory data sheet for every piece of equipment in the specifications.
7. The fifth section shall contain a wiring designation schedule for each circuit leaving each piece of equipment and 1/8th inch scaled floor plan drawings showing system wiring.

C. The Contractor shall provide two copies of an "Operating and Servicing Manual" for the system. The manuals shall be bound in flexible binders. All data shall be printed material or typewritten. Each manual shall include the following: Instructions necessary for the proper operation and servicing of the system; complete as-built installation drawings of the system; a wiring destination schedule for each circuit leaving for each piece of equipment; a schematic diagram of major components with all transistor and IC complements and replacement number.

PART 2 - PRODUCTS

2.1 INTRUSION ALARM SYSTEM

A. Description of System
1. The system shall consist of a new Control panel, with new power supplies as required; door switches and motion detection devices connected to detect intrusion into the covered areas. The system shall be zoned per each classroom indicated on the drawings and shall have a control panel capable of providing alarm and trouble signals, by zone, for connection to the District equipment and transmitted as per District requirements. The system shall also have 2 separate zones interconnected to the Fire Alarm system control panel for alarm and trouble. System on-off and access control from remote equipment furnished by the College or by a remote push button key pads.
2. Each building shall be a separate compartment and the project shall have at least two D1255 or equal keypads mounted where directed by the College.

3. Contractor shall provide the first year of monitoring as part of this contract. Monitoring facility shall be as selected by the contractor.

B. Products:
1. Control panel shall be Bosch 9412GV4 with required cabinet/enclosure and all related batteries.
2. Motion detectors shall be PIR type – Bosch ISC-BPR2-W12 as required. Each with a popit.
3. Door switches: Sentrol 1078 series with mounting as necessary to adapt to doors furnished.
4. Cable shall be WestPenn 355 or as required or equal.
5. Provide all power supplies for motion detectors as required.
6. Provide all necessary hardware and software for a complete and working system.

C. Testing:
1. System shall detect the entry through a door switched door and/or the motion of a body taking not more than four steps in an area secured with motion detection equipment where entry doors or windows are possible access. System shall be complete and properly operating prior to calling for the test. The inspector, contractor and engineer shall walk test system at district's option and contractor shall make minor satisfactory adjustments to the system in the presence of the inspector. Contractor shall coordinate the time of test with the district inspector. This test shall be performed during a time when there is no other persons on the site.
2. Test equipment:
a. Provide two portable radio transceivers to be used when walk testing the security detection system. The transceivers shall be capable of communication throughout the site.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The wiring of the system shall be executed in accordance with the drawings and the equipment manufacturer's wiring diagrams. Should any variations in these requirements occur, the contractor shall notify the Architect before making any changes. It shall be the responsibility of the factory authorized distributor of the specified equipment to install the equipment and guarantee the system to operate as per plans and specifications.

B. Furnish all conductors, equipment plugs, terminal strips, etc., and labor to install a complete and operable system.

C. The cables within the rack or cabinets shall be carefully cabled and laced with no. 12 Cord waxed linen lacing twine or ty-raps. All cables shall be numbered for identification.

D. Splices of conductors in underground pull boxes is not permitted.

E. The labor employed by the contractor shall be regularly employed in the installation and repair of communication systems and shall be acceptable to the owner and architect to engage in the installation and service of this system.

F. The contractor shall thoroughly clean all equipment and materials. All exposed parts of the equipment, cabinets, and other equipment shall be left in a clean condition, unblemished and

free of all dirt, dust, smudges, spots, fingerprints, etc., The contractor shall remove all debris and rubbish occasioned by the electronic systems work from the site. The contractor shall thoroughly clean all buildings of any dirt, debris, rubbish, marks, etc., Caused by the performance of this work.

G. The contractor shall provide not less than eight (8) hours for instruction of personnel in the operation and maintenance of the systems. This instruction time shall be divided as directed by the District.

3.2 WARRANTY

A. The entire system shall be warranted free of mechanical or electrical defects for a period of one (1) year after final acceptance of the installation. Any material showing mechanical or electrical defects shall be replaced promptly at no expense to the purchaser.

B. The contractor shall maintain a competent service organization and shall, if requested, submit a service maintenance agreement to the owner after the end of the guarantee period.

C. A typewritten notice shall be posted at the equipment rack which shall indicate the firm, address and telephone number to call when service is necessary. The notice shall be mounted in a neatly finished metal frame with a clear plastic window and securely attached to the inside of the door.

3.3 TESTING

A. Provide all instruments for testing and demonstrating in the presence of the owner's inspector that the frequency response is as stated in the factory data sheets. Check all circuits and wiring to verify they are free of shorts and grounds. Perform all tests stated in each separate system specification.

B. The owner reserves the right to make independent tests of all equipment furnished to determine whether or not the equipment complies with the requirements specified herein and to accept or reject any or all of the equipment on the basis of the results thereby obtained.

END OF SECTION

SECTION 28 31 11- DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section of the specification includes the furnishing, installation, and connection of an intelligent reporting, microprocessor controlled, addressable, fire detection and emergency voice alarm communication system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control panels, auxiliary control devices, annunciators, power supplies, and wiring as shown on the drawings and specified herein.

B. The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.

C. The system shall be an active/interrogative type system where each addressable device is repetitively scanned, causing a signal to be transmitted to the main fire alarm control panel (FACP) indicating that the device and its associated circuit wiring is functional. Loss of this signal at the main FACP shall result in a trouble indication as specified hereinafter for the particular input.

D. The facility shall have an emergency voice alarm communication system. Digitally stored message sequences shall notify the building occupants that a fire or life safety condition has been reported. Message generator(s) shall be capable of automatically distributing up to eight (8) simultaneous, unique messages to appropriate audio zones within the facility based on the type and location of the initiating event. The Fire Command Center (FCC) shall also support Emergency manual voice announcement capability for both system wide or selected audio zones, and shall include provisions for the system operator to override automatic messages system wide or in selected zones.

E. The system shall be support additional, alternate Fire Command Centers, which shall be capable of simultaneous monitoring of all system events. Alternate Fire Command Centers shall also support an approved method of transferring the control functions to an alternate Fire Command Center when necessary. All Fire Command Centers shall be individually capable of assuming Audio Command functions such as Emergency Paging, audio zone control functions, and Firefighter's Telephone communication functions.

F. Each designated zone shall transmit separate and different alarm, supervisory and trouble signals to the Fire Command Center (FCC) and designated personnel in other buildings at the site via a multiplex communication network.

G. The fire alarm system shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001: ANSI/ASQC Q9001-1994.

H. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.

I. The installing company shall employ NICET (minimum Level II Fire Alarm Technology) technicians on site to guide the final check-out and to ensure the systems integrity.

1.2 SCOPE:

A. A new intelligent reporting, microprocessor controlled fire detection system shall be installed in accordance with the specifications and drawings.

B. The system shall be designed such that each signaling line circuit (SLC) is limited to only 80% of its total capacity at initial installation.
   1. Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.
   2. On Style 6 or 7 (Class A) configurations a single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
   3. Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.
   4. Speaker circuits may be controlled by NAC outputs built into the amplifiers, which shall function as addressable points on the Digital Audio Loop.
   5. Notification Appliance Circuits (NAC) speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone which ever is greater.
   6. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.
   7. Notification Appliance Circuits (NAC) speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.
   8. Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.
   9. Speaker circuits shall be arranged such that there is a minimum of one speaker circuit per smoke zone.
   10. Speaker circuits shall be electrically supervised for open and short circuit conditions. If a short circuit exists on a speaker circuit, it shall not be possible to activate that circuit.
   11. Audio amplifiers and tone generating equipment shall be electrically supervised for abnormal conditions. Digital amplifiers shall provide built-in speaker circuits, field configurable as four Class B (Style Y), or two Class A (Style Z) circuits.
   12. Digital amplifiers shall be capable of storing up to two minutes of digitally recorded audio messages and tones. The digital amplifiers shall also be capable of supervising the connection to the associated digital message generator, and upon loss of that connection shall be capable of one of the following system responses:
      a. The digital amplifier shall automatically broadcast the stored audio message.
      b. The digital amplifier shall switch to a mode where a local bus input on the digital amplifier will accept an input to initiate a broadcast of the stored message. This bus input shall be connected to a NAC on a local FACP for the purpose of providing an alternate means of initiating an emergency message during a communication fault condition.
      c. Speaker circuits shall be either 25 VRMS or 70VRMS. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements.
      d. Two-way emergency telephone (Fire Fighter Telephone) communication shall be supported between the Audio Command Center and up to seven (7) remote Fire Fighter's Telephone locations simultaneously on a telephone riser.
      e. Means shall be provided to connect FFT voice communications to the speaker

circuits in order to allow voice paging over the speaker circuit from a telephone handset.

f. The digital audio message generator shall be of reliable, non-moving parts, and support the digital storage of at least 16 or 32 minutes of tones and emergency messages, shall support programming options to string audio segments together to create up to 1000 messages, or to loop messages and parts of messages to repeat for pre-determined cycles or indefinitely.

C. Basic System Functional Operation

When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

1. The System Alarm LED shall flash.
2. A local piezo electric signal in the control panel shall sound.
3. The 640-character LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
4. Printing and history storage equipment shall log the information associated each new fire alarm control panel condition, along with time and date of occurrence.
5. All system output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm shall be executed, and the associated system outputs (notification appliances and/or relays) shall be activated.
6. The audio portion of the system shall sound the proper audio signal (consisting of tone, voice, or tone and voice) to the appropriate zones.

1.3 SUBMITALS

A. General:

1. Two copies of all submittals shall be submitted to the Architect/Engineer for review.
2. All references to manufacturer's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality. Equivalent compatible UL-listed equipment from other manufacturers may be substituted for the specified equipment as long as the minimum standards are met.
3. All substitute equipment proposed as equal to the equipment specified herein, shall meet or exceed the following standards. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.
3. Show annunciator layout, configurations, and terminations.

C. Manuals:

1. Submit simultaneously with the shop drawings, complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets.
2. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment.
3. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system.
4. Approvals will be based on complete submissions of manuals together with shop

drawings.

D. Software Modifications
1. Provide the services of a factory trained and authorized technician to perform all system software modifications, upgrades or changes. Response time of the technician to the site shall not exceed 4 hours.
2. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being made.

E. Certifications:
1. Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of the installation and the proposed performer of contract maintenance is an authorized representative of the major equipment manufacturer. Include names and addresses in the certification.

1.4 GUARANTY:

A. All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.

1.5 POST CONTRACT MAINTENANCE:

A. Complete maintenance and repair service for the fire alarm system shall be available from a factory trained authorized representative of the manufacturer of the major equipment for a period of five (5) years after expiration of the guaranty.

B. As part of the bid/proposal, include a quote for a maintenance contract to provide all maintenance, tests, and repairs described below. Include also a quote for unscheduled maintenance/repairs, including hourly rates for technicians trained on this equipment, and response travel costs for each year of the maintenance period. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.

C. Maintenance and testing shall be on a semiannual basis or as required by the AHJ. A preventive maintenance schedule shall be provided by the contractor describing the protocol for preventive maintenance. The schedule shall include:
1. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.
2. Each circuit in the fire alarm system shall be tested semiannually.
3. Each smoke detector shall be tested in accordance with the requirements of NFPA 72 Chapter 7.

1.6 POST CONTRACT EXPANSIONS:

A. The contractor shall have the ability to provide parts and labor to expand the system specified, if so requested, for a period of five (5) years from the date of acceptance.

B. As part of the submittal, include a quotation for all parts and material, and all installation and test labor as needed to increase the number of intelligent or addressable devices by ten percent (10%). This quotation shall include intelligent smoke detectors, intelligent heat detectors, addressable manual stations, addressable monitor modules and addressable modules equal in number to one tenth of the number required to meet this specification (list actual quantity of each type).

C. The quotation shall include installation, test labor, and labor to reprogram the system for this 10% expansion. If additional FACP hardware is required, include the material and labor necessary to install this hardware.

D. Do not include cost of conduit or wire or the cost to install conduit or wire.

E. Submittals that do not include this estimate of post contract expansion cost will not be accepted.

1.7 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification. The publications are referenced in text by the basic designation only.

B. National Fire Protection Association (NFPA) - USA:

1.	No. 70	National Electric Code (NEC)
2.	No. 72-1996	National Fire Alarm Code
3.	No. 90A	Air Conditioning Systems
4.	No. 92A	Smoke Control Systems
5.	No. 92B	Smoke Management Systems in Malls, Atria, Large Areas
6.	No. 101	Life Safety Code

C. Underwriters Laboratories Inc. (UL) - USA:

1.	No. 50	Cabinets and Boxes
2.	No. 268	Smoke Detectors for Fire Protective Signaling Systems
3.	No. 864	Control Units for Fire Protective Signaling Systems
4.	No. 268A	Smoke Detectors for Duct Applications.
5.	No. 521	Heat Detectors for Fire Protective
6.	No. 228	Door Closers-Holders for Fire Protective Signaling Systems.
7.	No. 464	Audible Signaling Appliances.
8.	No. 38	Manually Actuated Signaling Boxes.
9.	No. 346	Waterflow Indicators for Fire Protective Signaling Systems.
10.	No. 1481	Power supplies for Fire Protective Signaling Systems.
11.	No. 1076	Control Units for Burglar Alarm Proprietary Protective Signaling Systems.
12.	No. 1971	Visual Notification Appliances.

D. Local and State Building Codes.

E. All requirements of the Authority Having Jurisdiction (AHJ).

1.8 APPROVALS

A. The system shall have proper listing and/or approval from the following nationally recognized agencies:
   1. UL Underwriters Laboratories Inc

B. The Fire Alarm Control Panel and all transponders shall meet the modular listing requirements of the ninth edition of UL Standard 864 (Control Units). Each subassembly, including all printed circuits, shall include the appropriate UL modular label. This includes all printed circuit board assemblies, power supplies, and enclosure parts. Systems that do not include modular labels may require return to the factory for system upgrades, and are not acceptable.

C. The system shall be listed by the national agencies as suitable for extinguishing release applications. The system shall support release of high and low pressure CO2.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIAL, GENERAL

A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protected premises protective signaling (fire alarm) system. The authorized representative of the manufacturer of the major equipment, such as control panels, shall be responsible for the satisfactory installation of the complete system.

B. All equipment and components shall be installed in strict compliance with each manufacturer's recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation. Refer to the riser/connection diagram for all specific system installation/termination/wiring data.

C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

2.2 CONDUIT AND WIRE

A. Conduit:
   1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.
   2. Where possible, all wiring shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.
   3. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
   4. Wiring for 24 volt control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
   5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the

FACP manufacturer.

6. Conduit shall be 3/4 inch (19.1 mm) minimum.

B. Wire

1. All fire alarm system wiring must be new.
2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for initiating device circuits and signaling line circuits, and 14 AWG (1.63 mm) for notification appliance circuits.
3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
4. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
5. The system shall permit the use of IDC and NAC wiring in the same conduit with the multiplex communication loop.
6. All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring; a trouble signal will be activated until the system and its associated field wiring are restored to normal condition.
7. All analog voice speaker and analog telephone circuits shall use twisted/shielded pair to eliminate cross talk.

C. Terminal Boxes, Junction Boxes and Cabinets:

1. All boxes and cabinets shall be UL listed for their intended purpose.

D. Initiating circuits shall be arranged to serve like categories (manual, smoke, waterflow). Mixed category circuitry shall not be permitted except on signaling line circuits connected to intelligent reporting devices.

E. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod.

2.3 MAIN FIRE ALARM CONTROL PANEL OR NETWORK NODE:

A. The main FACP Central Console shall be a NOTIFIER Model NFS2-3030 and shall contain a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, control circuits, and notification appliance circuits, local and remote operator terminals, printers, annunciators, and other system controlled devices.

B. In conjunction with intelligent Loop Control Modules and Loop Expander Modules, the main FACP shall perform the following functions:

1. Supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions.
2. Supervise all initiating signaling and notification circuits throughout the facility by way of connection to addressable monitor and control modules.
3. Detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed. In the event of CPU failure, all SLC loop modules shall fallback to degrade mode. Such

degrade mode shall treat the corresponding SLC loop control modules and associated detection devices as conventional two-wire operation. Any activation of a detector in this mode shall automatically activate associated Notification Appliance Circuits.

4. Visually and audibly annunciate any trouble, supervisory, security or alarm condition on operator's terminals, panel display, and annunciators.
5. When a fire alarm condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
   a. The system alarm LED shall flash.
   b. A local piezo-electric audible device in the control panel shall sound a distinctive signal.
   c. The 640-character backlit LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
   d. Printing and history storage equipment shall log and print the event information along with a time and date stamp.
   e. All system outputs assigned via preprogrammed equations for a particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.
   f. When a trouble condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
   g. The system trouble LED shall flash.
   h. A local piezo-electric audible device in the control panel shall sound a distinctive signal.
   i. The 640-character backlit LCD display shall indicate all information associated with the trouble condition, including the type of trouble point and its location within the protected premises.
   j. Printing and history storage equipment shall log and print the event information along with a time and date stamp.
   k. All system outputs assigned via preprogrammed equations for a particular point in trouble shall be executed, and the associated system outputs (trouble notification appliances and/or relays) shall be activated.
6. When a supervisory condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
   a. The system trouble LED shall flash.
   b. A local piezo-electric audible device in the control panel shall sound a distinctive signal.
   c. The 640-character backlit LCD display shall indicate all information associated with the supervisory condition, including the type of trouble point and its location within the protected premises.
   d. Printing and history storage equipment shall log and print the event information along with a time and date stamp.
   e. All system outputs assigned via preprogrammed equations for a particular point in trouble shall be executed, and the associated system outputs (notification appliances and/or relays) shall be activated.
7. When a security alarm condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
   a. The system security LED shall flash.
   b. A local piezo-electric audible device in the control panel shall sound a distinctive signal.
   c. The 640-character backlit LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
   d. Printing and history storage equipment shall log and print the event information

along with a time and date stamp.
e. All system outputs assigned via preprogrammed equations for a particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.

8. When a pre-alarm condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
a. The system pre-alarm LED shall flash.
b. A local piezo-electric audible device in the control panel shall sound a distinctive signal.
c. The 640-character backlit LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
d. Printing and history storage equipment shall log and print the event information along with a time and date stamp.
e. All system outputs assigned via preprogrammed equations for a particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.

C. Operator Control
1. Acknowledge Switch:
a. Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the LCD display to the next alarm or trouble condition. In addition, the FACP shall support Block Acknowledge to allow multiple trouble conditions to be acknowledged with a single depression of this switch.
b. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.
2. Signal Silence Switch:
a. Depression of the Signal Silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition. The selection of notification circuits and relays that are silence able by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.
3. Drill Switch:
a. Depression of the Drill switch shall activate all programmed notification appliance circuits. The drill function shall latch until the panel is silenced or reset.
4. System Reset Switch:
a. Depression of the System Reset switch shall cause all electronically latched initiating devices to return to their normal condition. Initiating devices shall re-report if active. Active notification appliance circuits shall not silence upon Reset. Systems that de-activate and subsequently re-activate notification appliance circuits shall not be considered equal. All programmed Control-By-Event equations shall be re-evaluated after the reset sequence is complete if the initiating condition has cleared. Non-latching trouble conditions shall not clear and re-report upon reset.
5. Lamp Test:
a. The Lamp Test switch shall activate all local system LEDs, light each segment of the liquid crystal display and display the panel software revision for service personal.
6. Scroll Display Keys:
a. There shall be Scroll Display keys for FIRE ALARM, SECURITY,

SUPERVISORY, TROUBLE, and OTHER EVENTS. Depression of the Scroll Display key shall display the next event in the selected queue allowing the operator to view events by type.

7. Print Screen:
   a. Depression of the PRINT SCREEN switch shall send the information currently displayed on the 640-character display to the printer.

D. System Capacity and General Operation
1. The control panel shall be capable of expansion via up to 10 SLC modules. Each module shall support a maximum of 318 analog/addressable devices for a maximum system capacity of 3180 points. The system shall be capable of 3072 annunciation points per system regardless of the number of addressable devices.
2. The Fire Alarm Control Panel shall include a full featured operator interface control and annunciation panel that shall include a backlit 640-character liquid crystal display, individual, color coded system status LEDs, and a QWERTY style alphanumeric keypad for the field programming and control of the fire alarm system. Said LCD shall also support graphic bit maps capable of displaying the company name and logo of either the owner or installing company.
3. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the fire alarm control panel.
4. The FACP shall be able to provide the following software and hardware features:
   a. Pre-signal and Positive Alarm Sequence: The system shall provide means to cause alarm signals to only sound in specific areas with a delay of the alarm from 60 to up to 180 seconds after start of alarm processing. In addition, a Positive Alarm Sequence selection shall be available that allows a 15-second time period for acknowledging an alarm signal from a fire detection/initiating device. If the alarm is not acknowledged within 15 seconds, all local and remote outputs shall automatically activate immediately.
   b. Smoke Detector Pre-alarm Indication at Control Panel: To obtain early warning of incipient or potential fire conditions, the system shall support a programmable option to determine system response to real-time detector sensing values above the programmed setting. Two levels of Pre-alarm indication shall be available at the control panel: alert and action.
   c. Alert: It shall be possible to set individual smoke detectors for pre-programmed pre-alarm thresholds. If the individual threshold is reached, the pre-alarm condition shall be activated.
   d. Action: If programmed for Action and the detector reaches a level exceeding the pre-programmed level, the control panel shall indicate an action condition. Sounder bases installed with either heat or smoke detectors shall automatically activate on action Pre-Alarm level, with general evacuation on Alarm level.
   e. The system shall support a detector response time to meet world annunciation requirements of less than 3 seconds.
   f. Device Blink Control: Means shall be provided to turn off detector/module LED strobes for special areas.
   g. NFPA 72 Smoke Detector Sensitivity Test: The system shall provide an automatic smoke detector test function that meet the requirements of NFPA 72.
   h. Programmable Trouble Reminder: The system shall provide means to automatically initiate a reminder that troubles exist in the system. The reminder will appear on the system display and (if enabled) will sound a piezo alarm.
   i. On-line or Off-line programming: The system shall provide means to allow panel programming either through an off-line software utility program away from the panel or while connected and on-line. The system shall also support upload and download of programmed database and panel executive system

program to a Personal Computer/laptop.

j. History Events: The panel shall maintain a history file of the last 4000 events, each with a time and date stamp. History events shall include all alarms, troubles, operator actions, and programming entries. The control panels shall also maintain a 1000 event Alarm History buffer, which consists of the 1000 most recent alarm events from the 4000 event history file.

k. Smoke Control Modes: The system shall provide means to perform FSCS mode Smoke Control to meet NFPA-92A and 90B and HVAC mode to meet NFPA 90A.

l. The system shall provide means for all SLC devices on any SLC loop to be auto programmed into the system by specific address. The system shall recognize specific device type ID's and associate that ID with the corresponding address of the device.

m. Drill: The system shall support means to activate all silenceable fire output circuits in the event of a practice evacuation or "drill". If enabled for local control, the front panel switch shall be held for a minimum of 2 seconds prior to activating the drill function.

n. Passwords and Users: The system shall support two password levels, master and user. Up to 9 user passwords shall be available, each of which may be assigned access to the programming change menus, the alter status menus, or both. Only the master password shall allow access to password change screens.

o. Two Wire Detection: The system shall support standard two wire detection devices specifically all models of System Sensor devices, Fenwal PDS-7125/7126 and CPD-7021, Hochiki model SLK-24F/24FH, Edwards 6250B/6270B and 6264B and Simplex models 2098-9201/9202 and 9576.

p. Block Acknowledge: The system shall support a block Acknowledge for Trouble Conditions

q. Sensitivity Adjust: The system shall provide Automatic Detector Sensitivity Adjust based on Occupancy schedules including a Holiday list of up to 15 days.

r. Environmental Drift Control: The system shall provide means for setting Environmental Drift Compensation by device. When a detector accumulates dust in the chamber and reaches an unacceptable level but yet still below the allowed limit, the control panel shall indicate a maintenance alert warning. When the detector accumulates dust in the chamber above the allowed limit, the control panel shall indicate a maintenance urgent warning.

s. Custom Action Messages: The system shall provide means to enter up to 100 custom action messages of up to 160 characters each. It shall be possible to assign any of the 100 messages to any point.

t. Print Functions: The system shall provide means to obtain a variety of reports listing all event, alarm, trouble, supervisory, or security history. Additional reports shall be available for point activation for the last Walk Test performed, detector maintenance report containing the detector maintenance status of each installed addressable detector, all network parameters, all panel settings including broad cast time, event ordering, and block acknowledge, panel timer values for Auto Silence, Silence Inhibit, AC Fail Delay time and if enabled, Proprietary Reminder, and Remote Reminder timers, supervision settings for power supply and printers, all programmed logic equations, all custom action messages, all non-fire and output activations (if pre-programmed for logging) all active points filtered by alarms only, troubles only, supervisory alarms, prealarms, disabled points and activated points, all installed points filtered by SLC points, logic zones, annunicators, releasing zones, special zones, and trouble zones.

u. Local Mode: If communication is lost to the central processor the system shall

provide added survivability through the intelligent loop control modules. Inputs from devices connected to the SLC and loop control modules shall activate outputs on the same loop when the inputs and outputs have been set with point programming to participate in local mode or when the type codes are of the same type: that is, an input with a fir alarm type code shall activate an output with a fire alarm type code.

v. Resound based on type for security or supervisory: The system shall indicate a Security alarm when a monitor module point programmed with a security Type Code activates. If silenced alarms exist, a Security alarm will Resound the panel sounder. The system shall indicate a Supervisory alarm when a monitor module point programmed with a supervisory Type Code activates. If there are silenced alarms, a Supervisory alarm will Resound the panel sounder.

w. Read status preview - enabled and disabled points: Prior to re-enabling points, the system shall inform the user that a disabled device is in the alarm state. This shall provide notice that the device must be reset before the device is enabled thereby avoiding activation of the notification circuits.

x. Custom Graphics: When fitted with an LCD display, the panel shall permit uploading of a custom bit-mapped graphic to the display screen.

y. Multi-Detector and Cooperating Detectors: The system shall provide means to link one detector to up to two detectors at other addresses on the same loop in cooperative multi-detector sensing. There shall be no requirement for sequential addresses on the detectors and the alarm event shall be a result or product of all cooperating detectors chamber readings.

z. Tracking/Latching Duct (ion and photo): The system shall support both tracking and latching duct detectors either ion or photo types.

aa. ACTIVE EVENT: The system shall provide a Type ID called FIRE CONTROL for purposes of air-handling shutdown, which shall be intended to override normal operating automatic functions. Activation of a FIRE CONTROL point shall cause the control panel to (1) initiate the monitor module Control-by-Event, (2) send a message to the panel display, history buffer, installed printer and annunciators, (3) shall not light an indicator at the control panel, (4) Shall display ACTIVE on the LCD as well a display a FIRE CONTROL Type Code and other information specific to the device.

bb. NON-FIRE Alarm Module Reporting: A point with a type ID of NON-FIRE shall be available for use for energy management or other non-fire situations. NON-FIRE point operation shall not affect control panel operation nor shall it display a message at the panel LDC. Activation of a NON-FIRE point shall activate control by event logic but shall not cause any indication on the control panel.

cc. Security Monitor Points: The system shall provide means to monitor any point as a type security.

dd. One-Man Walk Test: The system shall provide both a basic and advanced walk test for testing the entire fire alarm system. The basic walk test shall allow a single operator to run audible tests on the panel. All logic equation automation shall be suspended during the test and while annunciators can be enabled for the test, all shall default to the disabled state. During an advanced walk test, field-supplied output point programming will react to input stimuli such as CBE and logic equations. When points are activated in advanced test mode, each initiating event shall latch the input. The advanced test shall be audible and shall be used for pull station verification, magnet activated tests on input devices, input and output device and wiring operation/verification.

ee. Control By Event Functions: CBE software functions shall provide means to program a variety of output responses based on various initiating events. The control panel shall operate CBE through lists of zones. A zone shall become listed when it is added to a point's zone map through point programming. Each

input point such as detector, monitor module or panel circuit module shall support listing of up to 10 zones into its programmed zone map.

ff. Permitted zone types shall be general zone, releasing zone and special zone. Each output point (control module, panel circuit module) can support a list of up to 10 zones including general zone, logic zone, releasing zone and trouble zone. It shall be possible for output points to be assigned to list general alarm. Non-Alarm or Supervisory points shall not activate the general alarm zone.

gg. 1000 General Zones: The system shall support up to 1000 general purpose software zones for linking inputs to outputs. When an input device activates, any general zone programmed into that device's zone map will be active and any output device that has an active general zone in its map will be active. It shall also be possible to use general zone as arguments in logic equations.

hh. 1000 Logic Equations: The system shall support up to 1000 logic equations for AND, OR, NOT, ONLY1, ANYX, XZONE or RANGE operators that allow conditional I/O linking. When any logic equation becomes true, all output points mapped to the logic zone shall activate.

ii. 10 trouble equations per device: The system shall provide support for up to 10 trouble equations for each device, which shall permit programming parameters to be altered, based on specific fault conditions. If the trouble equation becomes true, all output points mapped to the trouble zone shall activate.

jj. Control-By-Time: A time based logic function shall be available to delay an action for a specific period of time based upon a logic input with tracking feature. A latched version shall also be available. Another version of this shall permit activation on specific days of the week or year with ability to set and restore based on a 24 hour time schedule on any day of the week or year.

kk. Multiple agent releasing zones: The system shall support up to 10 releasing zones to protect against 10 independent hazards. Releasing zones shall provide up to three cross-zone and four abort options to satisfy any local jurisdiction requirements.

ll. Alarm Verification, by device, with timer and tally: The system shall provide a user-defined global software timer function that can be set for a specific detector or indicating panel module input. The timer function shall delay an alarm signal for a user-specified time period and the control panel shall ignore the alarm verification timer if another alarm is detected during the verification period. It shall also be possible to set a maximum verification count between 0 and 20 with the "0" setting producing no alarm verification. When the counter exceeds the threshold value entered, a trouble shall be generated to the panel.

E. Central Processing Unit

1. The Central Processing Unit shall communicate with, monitor, and control all other modules within the control panel. Removal, disconnection or failure of any control panel module shall be detected and reported to the system display by the Central Processing Unit.
2. The Central Processing Unit shall contain and execute all control-by-event (including Boolean functions including but not limited to AND, OR, NOT, ANYx, and CROSSZONE) programs for specific action to be taken if an alarm condition is detected by the system. Such control-by-event programs shall be held in non-volatile programmable memory, and shall not be lost with system primary and secondary power failure.
3. The Central Processing Unit shall also provide a real-time clock for time annotation, to the second, of all system events. The time-of-day and date shall not be lost if system primary and secondary power supplies fail.
4. The CPU shall be capable of being programmed on site without requiring the use of any external programming equipment. Systems that require the use of external

programmers or change of EPROMs are not acceptable.

5. Consistent with UL864 standards, the CPU and associated equipment are to be protected so that voltage surges or line transients will not affect them.
6. Each peripheral device connected to the CPU shall be continuously scanned for proper operation. Data transmissions between the CPU and peripheral devices shall be reliable and error free. The transmission scheme used shall employ dual transmission or other equivalent error checking techniques.
7. The CPU shall provide an EIA-232 interface between the fire alarm control panel and the UL Listed Electronic Data Processing (EDP) peripherals.
8. The CPU shall provide two EIA-485 ports for the serial connection to annunciation and control subsystem components.
9. The EIA-232 serial output circuit shall be optically isolated to assure protection from earth ground.
10. The CPU shall provide one high-speed serial connection for support of network communication modules.
11. The CPU shall provide double pole relays for FIRE ALARM, SYSTEM TROUBLE, SUPERVISORY, and SECURITY. The SUPERVISORY and SECURITY relays shall provide selection for additional FIRE ALARM contacts.
12. The EIA-485 interface may be used for network connection to a proprietary-receiving unit.

F. System Display

1. The system display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters.
2. The display assembly shall contain, and display as required, custom alphanumeric labels for all intelligent detectors, addressable modules, and software zones.
3. The system display shall provide a 640-character backlit alphanumeric Liquid Crystal Display (LCD). It shall also provide ten Light-Emitting-Diodes (LEDs), that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM, SECURITY, SUPERVISORY, SYSTEM TROUBLE, OTHER EVENT, SIGNALS SILENCED, POINT DISABLED, and CPU FAILURE.
4. The system display shall provide a QWERTY style keypad with control capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels with up to ten (one Master and nine User) passwords shall be accessible through the display interface assembly to prevent unauthorized system control or programming.
5. The system display shall include the following operator control switches: ACKNOWLEDGE, SIGNAL SILENCE, RESET, DRILL, and LAMP TEST. Additionally, the display interface shall allow scrolling of events by event type including, FIRE ALARM, SECURITY, SUPERVISORY, TROUBLE, and OTHER EVENTS. A PRINT SCREEN button shall be provided for printing the event currently displayed on the 640-character LCD.

G. Loop (Signaling Line Circuit) Control Module:

1. The Loop Control Module shall monitor and control a minimum of 318 intelligent addressable devices. This includes 159 intelligent detectors (Ionization, Photoelectric, or Thermal) and 159 monitor or control modules.
2. The Loop Control Module shall contain its own microprocessor and shall be capable of operating in a local/degrade mode (any addressable device input shall be capable of activating any or all addressable device outputs) in the unlikely event of a failure in the main CPU.
3. The Loop Control Module shall provide power and communicate with all intelligent addressable detectors and modules on a single pair of wires. This SLC Loop shall be

capable of operating as a NFPA Style 6 (Class B) circuit.

4. The SLC interface board shall be able to drive an NFPA Style 6 twisted unshielded circuit up to 12,500 feet in length. The SLC Interface shall also be capable of driving an NFPA Style 6, no twist, no shield circuit for limited distances determined by the manufacturer. In addition, SLC wiring shall meet the listing requirements for it to exit the building or structure. "T"-tapping shall be allowed in either case.
5. The SLC interface board shall receive analog or digital information from all intelligent detectors and shall process this information to determine whether normal, alarm, or trouble conditions exist for that particular device. Each SLC Loop shall be isolated and equipped to annunciate an Earth Fault condition. The SLC interface board software shall include software to automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information may also be used for automatic detector testing and the automatic determination of detector maintenance requirements.

H. Enclosures:
1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.
2. The back box and door shall be constructed of 0.060 steel with provisions for electrical conduit connections into the sides and top.
3. The door shall provide a key lock and include a transparent opening for viewing all indicators. For convenience, the door shall have the ability to be hinged on either the right or left-hand side.
4. The control unit shall be modular in structure for ease of installation, maintenance, and future expansion.

I. Digital Voice Command Center
1. The Digital Voice Command Center located with the FACP, shall contain all equipment required for all audio control, emergency telephone system control, signaling and supervisory functions. This shall include speaker zone indication and control, telephone circuit indication and control, digital voice units, microphone and main telephone handset.
2. Function: The Voice Command Center equipment shall perform the following functions:
   a. Operate as a supervised multi-channel emergency voice communication system.
   b. Operate as a two-way emergency telephone system control center.
   c. Audibly and visually annunciate the active or trouble condition of every speaker circuit and emergency telephone circuit.
   d. Audibly and visually annunciate any trouble condition for digital tone and voice units required for normal operation of the system.
   e. Provide all-call Emergency Paging activities through activation of a single control switch.
   f. As required, provide vectored paging control to specific audio zones via dedicated control switches.
   g. Provide a factory recorded "library" of voice messages and tones in standard WAV. File format, which may be edited and saved on a PC running a current Windows® operating system.
   h. Provide a software utility capable of off-line programming for the VCC operation and the audio message files. This utility shall support the creation of new programs as well as editing and saving existing program files. Uploading

or downloading the VCC shall not inhibit the emergency operation of other nodes on the fire alarm network.

i. Support an optional mode of operation with four analog audio outputs capable of being used with UL 864 fire-listed analog audio amplifiers and SCL controlled switching.

j. The Digital Voice Command shall be modular in construction, and shall be capable of being field programmable without requiring the return of any components to the manufacturer and without requiring use of any external computers or other programming equipment.

k. The Digital Voice Command and associated equipment shall be protected against unusually high voltage surges or line transients.

J. Power Supply:

1. The Addressable Main Power Supply shall operate on 120/240 VAC, 50/60 Hz, and shall provide all necessary power for the FACP.
2. The Addressable Main Power Supply shall provide the required power to the CPU using a switching 24 VDC regulator and shall incorporate a battery charger for 24 hours of standby power using dual-rate charging techniques for fast battery recharge.
3. The Addressable Main Power Supply shall provide a battery charger for 24 hours of standby using dual-rate charging techniques for fast battery recharge. The supply shall be capable of charging batteries ranging in capacity from 25-200 amp-hours within a 48-hour period.
4. The Addressable Main Power Supply shall provide a very low frequency sweep earth detect circuit, capable of detecting earth faults.
5. The Addressable Main Power Supply shall be power-limited per UL864 requirements.

K. Auxiliary Field Power Supply - Addressable

1. The auxiliary addressable power supply is a remote 24 VDC power supply used to power Notification Devices and field devices that require regulated 24VDC power. The power supply shall also include and charge backup batteries.
2. The addressable power supply for the fire alarm system shall provide up a minimum of 6.0 amps of 24 volt DC regulated power for Notification Appliance Circuit (NAC) power or 5 amps of 24 volt DC general power. The power supply shall have an additional .5 amp of 24 VDC auxiliary power for use within the same cabinet as the power supply. It shall include an integral charger designed to charge 7.0 - 25.0 amp hour batteries.
3. The addressable power supply shall provide four individually addressable Notification Appliance Circuits that may be configured as two Class "A" and two Class "B" or four Class "B" only circuits. All circuits shall be power-limited per UL 864 requirements.
4. The addressable power supply shall provide built-in synchronization for certain Notification Appliances on each circuit without the need for additional synchronization modules. The power supply's output circuits shall be individually selected for synchronization. A single addressable power supply shall be capable of supporting both synchronized and non-synchronized Notification Devices at the same time.
5. The addressable power supply shall operate on 120 or 240 VAC, 50/60 Hz.
6. The interface to the power supply from the Fire Alarm Control Panel (FACP) shall be via the Signaling Line Circuit (SLC) or other multiplexed means Power supplies that do not use an intelligent interface are not suitable substitutes. The required wiring from the FACP to the addressable power supply shall be a single unshielded twisted pair wire. Data on the SLC shall be transmitted between 24 VDC, 5 VDC and 0 VDC at approximately 3.33k baud.
7. The addressable power supply shall supervise for battery charging failure, AC power loss, power brownout, battery failure, NAC loss, and optional ground fault detection. In the event of a trouble condition, the addressable power supply shall report the

incident and the applicable address to the FACP via the SLC.

8. The addressable power supply shall have an AC Power Loss Delay option. If this option is utilized and the addressable power supply experiences an AC power loss, reporting of the incident to the FACP will be delayed. A delay time of eight or sixteen hours shall be Dip-switch selected.
9. The addressable power supply shall have an option for Canadian Trouble Reporting and this option shall be Dip-switch selectable.
10. The addressable power supply mounts in either the FACP backbox or it's own dedicated surface mounted backbox with cover.
11. Each of the power supply's four output circuits shall be DIP-switch selected for Notification Appliance Circuit or General Purpose 24 VDC power. Any output circuit shall be able to provide up to 2.5 amps of 24 VDC power.
12. The addressable power supply's output circuits shall be individually supervised when they are selected to be either a Notification Appliance Circuit when wired Class "A" or by the use of and end-of-line resistor. When the power supply's output circuit is selected as General 24VDC power, the circuit shall be individually supervised when an end-of-line relay is used.
13. When selected for Notification Appliance Circuits, the output circuits shall be individually DIP-switch selectable for Steady, March Time, Dual Stage or Temporal.
14. When selected as a Notification Appliance Circuit, the output circuits of the addressable power supply shall have the option to be coded by the use of a universal zone coder.
15. The addressable power supply shall interface and synchronize with other power supplies of the same type. The required wiring to interface multiple addressable power supplies shall be a single unshielded, twisted pair wire.
16. An individual or multiple interfaced addressable power supplies shall have the option to use an external charger for battery charging. Interfaced power supplies shall have the option to share backup battery power.

L. System Circuit Supervision

1. The FACP shall supervise all circuits to intelligent devices, transponders, annunciators and peripheral equipment and annunciate loss of communication with these devices. The CPU shall continuously scan above devices for proper system operation and upon loss of response from a device shall sound an audible trouble, indicate which device or devices are not responding and print the information in the history buffer and on the printer.
2. Transponders that lose communication with the CPU shall sound an audible trouble and light an LED indicating loss of communications.
3. Sprinkler system valves, standpipe control valves, PIV, and main gate valves shall be supervised for off-normal position.
4. All speaker and emergency phone circuits shall be supervised for opens and shorts. Each transponder speaker and emergency phone circuit shall have an individual ON/OFF indication (green LED).

M. Field Wiring Terminal Blocks

1. All wiring terminal blocks shall be the plug-in/removable type and shall be capable of terminating up to 12 AWG wire. Terminal blocks that are permanently fixed to the PC board are not acceptable.

N. Audio Amplifiers

1. The Audio Amplifiers will provide Audio Power (@25 Volts RMS) for distribution to speaker circuits.
2. Multiple audio amplifiers may be mounted in a single enclosure, either to supply incremental audio power, or to function as an automatically switched backup

amplifier(s).

3. The audio amplifier shall include an integral power supply, and shall provide built-in LED indicators for the following conditions:
   a. Earth Fault on DAP A (Digital Audio Port A)
   b. Earth Fault on DAP B (Digital Audio Port B)
   c. Audio Amplifier Failure Detected Trouble
   d. Active Alarm Bus input
   e. Audio Detected on Aux Input A
   f. Audio Detected on Aux Input B
   g. Audio Detected on Firefighter's Telephone Riser
   h. Receiving Audio from digital audio riser
   i. Short circuit on speaker circuit 1
   j. Short circuit on speaker circuit 2
   k. Short circuit on speaker circuit 3
   l. Short circuit on speaker circuit 4
   m. Data Transmitted on DAP A
   n. Data Received on DAP A
   o. Data Transmitted on DAP B
   p. Data Received on DAP B
   q. Board failure
   r. Active fiber optic media connection on port A (fiber optic media applications)
   s. Active fiber optic media connection on port B (fiber optic media applications)
   t. Power supply Earth Fault
   u. Power supply 5V present
   v. Power supply conditions - Brownout, High Battery, Low Battery, Charger Trouble
4. The audio amplifier shall provide the following built-in controls:
   a. Amplifier Address Selection Switches
   b. Signal Silence of communication loss annunciation Reset
   c. Level adjustment for background music
   d. Enable/Disable for Earth Fault detection on DAP A
   e. Enable/Disable for Earth Fault detection on DAP A
      Switch for 2-wire/4-wire FFT riser
5. Adjustment of the correct audio level for the amplifier shall not require any special tools or test equipment.
6. Includes audio input and amplified output supervision, back up input, and automatic switch over function, (if primary amplifier should fail).
7. System shall be capable of backing up digital amplifiers.

O. Audio Message Generator (Prerecorded Voice)/Speaker Control:
1. Each initiating zone or intelligent device shall interface with an emergency voice communication system capable of transmitting a prerecorded voice message to all speakers in the building.
2. Actuation of any alarm initiating device shall cause a prerecorded message to sound over the speakers. The message shall be repeated four (4) times. Pre- and post-message tones shall be supported.
3. A built-in microphone shall be provided to allow paging through speaker circuits.
4. System paging from emergency telephone circuits shall be supported.
5. The audio message generator shall have the following indicators and controls to allow for proper operator understanding and control:
   a. LED Indicators:
      1. Lamp Test
      2. Trouble
      3. Off-Line Trouble

4. Microphone Trouble
5. Phone Trouble
6. Busy/Wait
7. Page Inhibited
8. Pre/Post Announcement Tone

P. Controls with associated LED Indicators:
1. Speaker Switches/Indicators
   a. The speaker circuit control switches/indicators shall include visual indication of active and trouble status for each speaker circuit in the system.
   b. The speaker circuit control panel shall include switches to manually activate or deactivate each speaker circuit in the system.
2. Emergency Two-Way Telephone Control Switches/Indicators
   a. The emergency telephone circuit control panel shall include visual indication of active and trouble status for each telephone circuit in the system.
   b. The telephone circuit control panel shall include switches to manually activate or deactivate each telephone circuit in the system.

Q. Remote Transmissions:
1. Provide local energy or polarity reversal or trip circuits as required.
2. The system shall be capable of operating a polarity reversal or local energy or fire alarm transmitter for automatically transmitting fire information to the fire department.
3. Provide capability and equipment for transmission of zone alarm and trouble signals to remote operator's terminals, system printers and annunciators.
4. Transmitters shall be compatible with the systems and equipment they are connected to such as timing, operation and other required features.

R. System Expansion:
1. Design the main FACP and required components so that the system can be expanded in the future (to include the addition of twenty percent more circuits or zones) without disruption or replacement of the existing control panel. This shall include hardware capacity, software capacity and cabinet space.

S. Field Programming
1. The system shall be programmable, configurable and expandable in the field without the need for special tools, laptop computers, or other electronic interface equipment. There shall be no firmware changes required to field modify the system time, point information, equations, or annunciator programming/information.
2. It shall be possible to program through the standard FACP keyboard all system functions.
3. All field defined programs shall be stored in non-volatile memory.
4. Two levels of password protection shall be provided in addition to a key-lock cabinet. One level shall be used for status level changes such as point/zone disable or manual on/off commands (Building Manager). A second (higher-level) shall be used for actual change of the life safety program (installer). These passwords shall be five (5) digits at a minimum. Upon entry of an invalid password for the third time within a one minute time period an encrypted number shall be displayed. This number can be used as a reference for determining a forgotten password.
5. The system programming shall be "backed" up via an upload/download program, and stored on compatible removable media. A system back-up disk shall be completed and given in duplicate to the building owner and/or operator upon completion of the final inspection. The program that performs this function shall be "non-proprietary", in that, it shall be possible to forward it to the building owner/operator upon his or her request.

6. The installer's field programming and hardware shall be functionally tested on a computer against known parameters/norms which are established by the FACP manufacturer. A software program shall test Input-to-Output correlations, device Type ID associations, point associations, time equations, etc. This test shall be performed on an IBM-compatible PC with a verification software package. A report shall be generated of the test results and two copies turned in to the engineer(s) on record.

T. Specific System Operations
1. Smoke Detector Sensitivity Adjust: Means shall be provided for adjusting the sensitivity of any or all analog intelligent smoke detectors in the system from the system keypad or from the keyboard of the video terminal. Sensitivity range shall be within the allowed UL window.
2. Alarm Verification: Each of the Intelligent Addressable Smoke Detectors in the system may be independently selected and enabled to be an alarm verified detector. The alarm verification function shall be programmable from 5 to 50 seconds and each detector shall be able to be selected for verification during the field programming of the system or anytime after system turn-on. Alarm verification shall not require any additional hardware to be added to the control panel. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.

U. System Point Operations:
1. Any addressable device in the system shall have the capability to be enabled or disabled through the system keypad or video terminal.
2. System output points shall be capable of being turned on or off from the system keypad or the video terminal.
3. Point Read: The system shall be able to display the following point status diagnostic functions without the need for peripheral equipment. Each point shall be annunciated for the parameters listed:
   a. Device Status.
   b. Device Type.
   c. Custom Device Label.
   d. Software Zone Label.
   e. Device Zone Assignments.
   f. Analog Detector Sensitivity.
   g. All Program Parameters.
4. System Status Reports: Upon command from an operator of the system, a status report will be generated and printed, listing all system statuses:
5. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 4000 system events. Each of these events will be stored, with time and date stamp, until an operator requests that the contents be either displayed or printed. The contents of the history buffer may be manually reviewed; one event at a time, and the actual number of activations may also be displayed and or printed. History events shall include all alarms, troubles, operator actions, and programming entries.
6. The history buffer shall use non-volatile memory. Systems which use volatile memory for history storage are not acceptable.
7. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent system detector and shall analyze the detector responses over a period of time.
8. If any intelligent detector in the system responds with a reading that is below or above normal limits, then the system will enter the trouble mode, and the particular Intelligent Detector will be annunciated on the system display, and printed on the optional system printer. This feature shall in no way inhibit the receipt of alarm

conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.

9. The system shall include the ability (programmable) to indicate a "pre-alarm" condition. This will be used to alert maintenance personal when a detector is at 80% of its alarm threshold in a 60 second period.

2.4. SYSTEM COMPONENTS:

A. Speakers:
1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.
2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

B. Audible/Visual Combination Devices:
1. Shall meet the applicable requirements of Section A listed above for audibility.
2. Shall meet the requirements of Section B listed above for visibility.

C. Strobe lights shall meet the requirements of the ADA, UL Standard 1971, be fully synchronized, and shall meet the following criteria:
1. The maximum pulse duration shall be 2/10 of one second
2. Strobe intensity shall meet the requirements of UL 1971.
3. The flash rate shall meet the requirements of UL 1971.

D. Automatic Conventional Heat Detectors
1. Automatic heat detectors shall have a combination rate of rise and fixed temperature rated at 135 degrees Fahrenheit (57.2 Celsius) for areas where ambient temperatures do not exceed 100 degrees (37.7 Celsius), and 200 degrees (93.33 Celsius) for areas where the temperature does not exceed 150 degrees (65.5 Celsius).
2. Automatic heat detectors shall be a low profile, ceiling mount type with positive indication of activation.
3. The rate of rise element shall consist of an air chamber, a flexible metal diaphragm, and a factory calibrated, moisture-proof, trouble free vent, and shall operate when the rate of temperature rise exceeds 15 degrees F (9.4 degrees C) per minute.
4. The fixed temperature element shall consist of a fusible alloy retainer and actuator shaft.
5. Automatic heat detectors shall have a smooth ceiling rating of 2500 square feet (762 square meters).

E. Waterflow Indicator:
1. Waterflow Switches shall be an integral, mechanical, non-coded, non-accumulative retard type.
2. Waterflow Switches shall have an alarm transmission delay time which is conveniently adjustable from 0 to 60 seconds. Initial settings shall be 30-45 seconds.
3. All waterflow switches shall come from a single manufacturer and series.
4. Waterflow switches shall be provided and connected under this section but installed by the mechanical contractor.
5. Where possible, locate waterflow switches a minimum of one (1) foot from a fitting which changes the direction of the flow and a minimum of three (3) feet from a valve.

F. Sprinkler and Standpipe Valve Supervisory Switches:
1. Each sprinkler system water supply control valve riser, zone control valve, and standpipe system riser control valve shall be equipped with a supervisory switch. Standpipe hose valves, and test and drain valves shall not be equipped with supervisory switches.
2. PIV (post indicator valve) or main gate valves shall be equipped with a supervisory switch.
3. The switch shall be mounted so as not to interfere with the normal operation of the valve and adjusted to operate within two revolutions toward the closed position of the valve control, or when the stem has moved no more than one-fifth of the distance from its normal position.
4. The supervisory switch shall be contained in a weatherproof aluminum housing, which shall provide a 3/4 inch (19 mm) conduit entrance and incorporate the necessary facilities for attachment to the valves.
5. The switch housing shall be finished in red baked enamel.
6. The entire installed assembly shall be tamper proof and arranged to cause a switch operation if the housing cover is removed, or if the unit is removed from its mounting.
7. Valve supervisory switches shall be provided and connected under this section and installed by mechanical contractor.
    a. This unit shall provide for each zone: alarm indications, using a red alarm an yellow trouble long-life LEDs and control switches for the control of fire alarm control panel functions. The annunciator will also have an ON-LINE LED, local piezo electric signal, local acknowledge/lamp test switch, and custom slide-in zone/function identification labels.
    b. Switches shall be available for remote annunciation and control of output points in the system, system acknowledge, telephone zone select, speaker select, global signal silence, and global system reset within the confines of all applicable standards.

G. Interactive Display
1. The system shall be an ONYX FirstVision™.
2. The system shall operate on an UL listed Embedded platform operating at no less than 700 MHz on the Microsoft® Windows® XP Embedded platform.
3. The Embedded platform shall have: no less than 256 megabytes of RAM, a flash drive with no less than 1 Gigabytes of storage space, 100 Base-T Ethernet NIC card, and USB ports.
4. The Embedded platform shall have a minimum 17" touchscreen display.
5. The Embedded platform shall come equipped with all necessary gateway modules to allow connection to the network it monitors as standard equipment.
    a. A UL listed Ethernet Hub shall be provided for connection of multiple interactive displays and/or gateways.

H. Fixed Emergency Telephone Handset
1. The telephone cabinet shall be painted red and clearly labeled as "Emergency Telephone." The cabinets shall be located where shown on drawings.
2. The handset cradle shall have a switch connection so that lifting the handset off of the cradle shall send a signal to the fire command center, which shall audibly and visually indicate its on-line (off-hook) condition.
3. On activating the remote phone, the phone earpiece shall sound a telephone ring signal until the master handset is lifted.
4. The two-way emergency telephone system shall support a minimum of seven (7) handsets on line without degradation of the signal.

I. Universal Digital Alarm Communicator Transmitter (UDACT). The UDACT is an interface

for communicating digital information between a fire alarm control panel and an UL-Listed central station.

1. The UDACT shall be compact in size, mounting in a standard module position of the fire alarm control cabinet. Optionally, the UDACT shall have the ability for remote mounting, up to 6,000 feet from the fire alarm control panel. The wire connections between the UDACT and the control panel shall be supervised with one pair for power and one pair for multiplexed communication of overall system status. Systems that utilize relay contact closures are not acceptable.
2. The UDACT shall include connections for dual telephone lines (with voltage detect), per UL/NFPA/FCC requirements. It shall include the ability for split reporting of panel events up to three different telephone numbers.
3. The UDACT shall be completely field programmable from a built-in keypad and 4 character red, seven segment display.
4. The UDACT shall be capable of transmitting events in at least 15 different formats. This ensures compatibility with existing and future transmission formats.
5. Communication shall include vital system status such as:
    a. Independent Zone (Alarm, trouble, non-alarm, supervisory)
    b. Independent Addressable Device Status
    c. AC (Mains) Power Loss
    d. Low Battery and Earth Fault
    e. System Off Normal
    f. 12 and 24 Hour Test Signal
    g. Abnormal Test Signal (per UL requirements)
    h. EIA-485 Communications Failure
    i. Phone Line Failure
6. The UDACT shall support independent zone/point reporting when used in the Contact ID format. In this format the UDACT shall support transmission of up to 2,040 points. This enables the central station to have exact details concerning the origin of the fire or response emergency.

2.5. SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices - General

1. Addressable devices shall provide an address-setting means using rotary decimal switches.
2. Addressable devices shall use simple to install and maintain decade (numbered 0 to 9) type address switches. Devices which use a binary address or special tools for setting the device address, such as a dip switch are not an allowable substitute.
3. Detectors shall be Analog and Addressable, and shall connect to the fire alarm control panel's Signaling Line Circuits.
4. Addressable smoke and thermal detectors shall provide dual (2) status LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. If required, the flashing mode operation of the detector LEDs can be programmed off via the fire control panel program.
5. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system. Sensitivity can be automatically adjusted by the panel on a time-of-day basis.
6. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.

7. The detectors shall be ceiling-mount and shall include a separate twist-lock base which includes a tamper proof feature.
8. The following bases and auxiliary functions shall be available :
   a. Sounder base rated at 85 DBA minimum.
   b. Form-C Relay base rated 30VDC, 2.0A
   c. isolator base
9. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel.
10. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (example: ION, PHOTO, THERMAL).

B. Addressable Manual Fire Alarm Box (manual station)
1. Addressable manual fire alarm boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.
2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
3. Manual fire alarm boxes shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches (44 mm) or larger.

C. Intelligent Photoelectric Smoke Detector
1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

D. Intelligent Duct Smoke Detector
1. The smoke detector housing shall accommodate either an intelligent ionization detector or an intelligent photoelectric detector, of that provides continuous analog monitoring and alarm verification from the panel.
2. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system.

E. Addressable Dry Contact Monitor Module
1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLCs.
2. The IDC zone shall be suitable for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.
3. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.

F. Two Wire Detector Monitor Module
1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional 2-wire smoke detectors or alarm initiating devices (any N.O. dry contact device).

2. The IDC zone may be wired for Class A or B (Style D or Style B) operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

G. Addressable Relay Module
1. Addressable Relay Modules shall be available for HVAC control and other building functions. The relay shall be form C and rated for a minimum of 2.0 Amps resistive or 1.0 Amps inductive. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.

2.6. BATTERIES AND EXTERNAL CHARGER:

A. Battery:
1. Shall be 12 volt, Gell-Cell type.
2. Battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.
3. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks refilling, spills and leakage shall not be required.

B. External Battery Charger:
1. Shall be completely automatic, with constant potential charger maintaining the battery fully charged under all service conditions. Charger shall operate from a 120/240-volt 50/60 hertz source.
2. Shall be rated for fully charging a completely discharged battery within 48 hours while simultaneously supplying any loads connected to the battery.
3. Shall have protection to prevent discharge through the charger.
4. Shall have protection for overloads and short circuits on both AC and DC sides.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.

B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.

C. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.

D. Manual Pull Stations shall be suitable for surface mounting or semiflush mounting as shown on the plans, and shall be installed not less than 42 inches, nor more than 48 inches above the finished floor

3.2. TYPICAL OPERATION:

A. Actuation of any manual station, smoke detector heat detector or water flow switch shall cause the following operations to occur unless otherwise specified:
   1. Activate all programmed speaker circuits.
   2. Actuate all strobe units until the panel is reset.
   3. Light the associated indicators corresponding to active speaker circuits.
   4. Release all magnetic door holders to doors to adjacent zones on the floor from that the alarm was initiated.
   5. Return all elevators to the primary or alternate floor of egress.
   6. A smoke detector in any elevator lobby shall, in addition to the above functions, return all elevators to the primary or alternate floor of egress.
   7. Smoke detectors in the elevator machine room or top of hoistway shall return all elevators in to the primary or alternate floor. Smoke detectors or heat detectors installed to shut down elevator power shall do so in accordance with ANSI A17.1 requirements and be coordinated with the electrical contractor.
   8. Duct type smoke detectors shall, in addition to the above functions shut down the ventilation system or close associated control dampers as appropriate.
   9. Activation of any sprinkler system low pressure switch or valve tamper switch shall cause a system supervisory alarm indication.

3.3 TEST:

A. Provide the service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system.

B. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

C. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.

D. Verify activation of all flow switches.

E. Open initiating device circuits and verify that the trouble signal actuates.

F. Open signaling line circuits and verify that the trouble signal actuates.

G. Open and short notification appliance circuits and verify that trouble signal actuates.

H. Ground initiating device circuits and verify response of trouble signals.

I. Ground signaling line circuits and verify response of trouble signals.

J. Ground notification appliance circuits and verify response of trouble signals.

K. Check presence and audibility of tone at all alarm notification devices.

L. Check installation, supervision, and operation of all intelligent smoke detectors during a walk test.

M. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.

N. When the system is equipped with optional features, the manufacturer's manual should be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

3.4 FINAL INSPECTION:

A. At the final inspection a factory trained representative of the manufacturer of the major equipment shall demonstrate that the systems function properly in every respect.

3.5 INSTRUCTION:

A. Provide instruction as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.

B. The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation."

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner’s maintenance personnel to adjust, operate, and maintain related equipment specified.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Removal of vegetation, grass, grass roots, shrubs, tree stumps, trees, upturned stumps, weed growth, tree roots, brush, masonry, concrete, rubbish, debris and other materials.
2. Removal of concrete and bituminous surfaces.
3. Removal of existing fences and gates.

B. Related Requirements:
1. Division 01 - General Requirements.
2. Section 31 22 00 - Grading.
3. Section 31 23 13 - Excavation and Fill.
4. Section 31 23 16 - Excavation and Fill for Pavement.
5. Section 31 23 23 - Excavation and Fill for Utilities.
6. Section 31 23 26 - Base Course.
7. Section 32 31 13 - Chain Link Fences and Gates.
8. Section 32 90 00 - Planting.

1.2 SUBMITTALS

A. Shop Drawings: Submit site plan indicating extent of site clearing.

1.3 QUALITY ASSURANCE

A. Comply with Standard Specifications for Public Works Construction, current edition, as a minimum requirement.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 TREE AND STUMP REMOVAL

A. Remove trees and stumps indicated or required to be removed. Remove trees, together with bulk of roots, to a minimum depth of 4 feet below required grade, and within a radius of approximately 7 feet beyond perimeter of trunk at grade.

B. Fill and compact excavation from tree and stump removal. Fill in 6 inch layers, each compacted to 90 percent of maximum density in accordance with ASTM D1557.
1. Back filling shall not commence until the excavation is inspected and tested.

3.2 CONCRETE AND BITUMINOUS SURFACING REMOVAL

A. Break up and completely remove existing concrete surfacing, curbs, gutters, walks and bituminous surfacing to indicated limits. Cutting shall be performed to a neat and even line with proper tools or a concrete cutting saw. Minimum depth of cut shall be 1 1/2-inch, unless otherwise indicated. Remove concrete broken beyond the indicated limits to the nearest joint or score line and replace with new concrete to match existing.

3.3 FENCING

A. Existing fences scheduled to remain may be removed to facilitate the Work, provided they are installed to their original condition in accordance with requirements of Section 32 31 13 - Chain Link Fences and Gates.

B. Fencing indicated to be removed and not reinstalled shall be completely removed, including footings. Fill and compact excavations.

C. Install chain link fencing indicated to be relocated or reset in accordance with applicable requirements specified under Section 32 31 13 - Chain Link Fences and Gates.

3.4 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 31 22 00 - GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General exterior grading, cutting and filling, including grading for building area, paving, planting areas, banks and hillsides.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 31 10 00 - Site Clearing.
   3. Section 31 23 13 - Excavation and Fill.
   4. Section 31 23 16 - Excavation and Fill for Pavement.
   5. Section 31 23 23 - Excavation and Fill for Utilities.
   6. Section 31 23 26 - Base Course.
   7. Section 32 90 00 - Planting.

1.2 PROJECT REQUIREMENTS

A. General:
   1. Fees: Pay as required by authorities having jurisdiction over the area.
   2. Bonds: Post as required by authorities having jurisdiction over the area.
   3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.
   4. Before grading, contact Underground Service Alert of Southern California (USASC) for information on public buried utilities and pipelines. Retain the services of an underground utility locator for on-site utilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials shall conform to requirements specified in this and related sections.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain installed stakes until their removal is required for the Work. Provide replacement grade or location stakes lost or disturbed.

B. Install grade stakes and compare to indicated grades. If discrepancies are found between existing grades and grades indicated on Drawings, do not proceed until discrepancies are resolved.

3.2 ROUGH AND FINE GRADING

A. Rough grade area sufficiently high to require cutting by fine grading:
   1. Grade area for bituminous surfacing and other paving to the indicated grades, equal to the section of the indicated base and pavement.
   2. Slope banks to required finish grades as cut progresses or leave cuts full and finish grade by mechanical equipment to provide grades and soil densities indicated on the Drawings.
   3. Rough grade, fill and compact banks beyond indicated finish grades. Finish grade banks and slopes to indicated grades and specified soil densities.
   4. Grade Only Areas: In areas not indicated to receive pavement, rough grade to approximate finish grades and then scarify, moisten and roll to obtain required density and indicated finish grades.
   5. Tolerances: Finish grades shall be within a tolerance of 0.05 inch per foot above or below grades indicated. Provide an average grade as indicated.

B. Base or Subgrade:
   1. After subgrade has been constructed to approximate required grades, scarify to a depth of at least 6 inches:
      a. After scarifying, process loosened material to a finely divided condition and adjust moisture content to optimum condition by addition of water, addition and blending of dry suitable material, or by drying of existing material.
      b. Subgrade material shall be compacted by tamping, sheepsfoot rollers or pneumatic tire rollers. Required relative compaction shall be [**90**] percent minimum for the top 6 inches below subgrade.
      c. Install base course in accordance with Section 31 23 26 - Base Course.
   2. Tolerance of completed grades of base or subgrade shall not vary more than 0.03 inch per foot from grades indicated. Provide an average grade as indicated.

3.3 SHORING

A. Provide shoring as necessary to properly and safely support earth sides of excavations, and existing curbs, sidewalks, gutter, drives and stairs, against movement and collapse.

B. Design and Calculations: Provide in accordance with requirement of CalOHSA.

C. Remove shoring upon completion of the Work of this section or when no longer needed unless required otherwise by authorities having jurisdiction.

3.4 EXCESS MATERIAL DISPOSAL

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.5 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 31 23 13 - EXCAVATION AND FILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating, filling, backfilling, and compacting for Project site pavement, planting areas, buildings, and other structures.
2. Trenches for utility lines such as water, gas, irrigation, storm drain and sewer lines, concrete-encased conduits, manholes, vaults, valve boxes, catch basins, underground tanks, thrust blocks, yard boxes, pull boxes, and other utility appurtenances.

B. Related Requirements:
1. Division 01 - General Requirements.
2. Section 01 45 24 - Environmental Import/Export Materials Testing.
3. Section 31 10 00 - Site Clearing.
4. Section 31 22 00 - Grading.
5. Section 31 23 26 - Base Course.
6. Section 32 01 17 - Pavement Repair.
7. Section 32 13 13 - Site Concrete Work.
8. Section 32 31 13 - Chain Link Fences and Gates.
9. Section 32 84 13 - Potable Water Irrigation.
10. Section 32 84 26 - Reclaimed Water Irrigation.
11. Section 32 90 00 - Planting.
12. Section 33 40 00 - Storm Drainage Utilities.
13. Division 22 - Plumbing.
14. Division 26 - Electrical.

1.2 PROJECT REQUIREMENTS

A. Import and Export of Earth Materials:
1. Fees: Pay as required by authorities having jurisdiction over the area.
2. Bonds: Post as required by authorities having jurisdiction over the area.
3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.3 SUBMITTALS

A. Shoring calculations as required in Article 3.03 of this Section.

1.4 QUALITY ASSURANCE

A. Comply with the Standard Specifications for Public Works Construction, current edition, except as modified herein.

B. Sampling, testing, and certification of imported and exported soils shall be performed in accordance with Section 01 45 24, Environmental Import/Export Materials Testing.

1.5 TESTING

A. OWNER will retain a Geotechnical Engineer as an OWNER Consultant who will provide observations, tests, inspections and approvals identified in the Contract Documents as being responsibility of OWNER.

B. Imported Soils: The Geotechnical Engineer will obtain initial product Sample for testing in accordance Article 3.05 of this Section.

1.6 PROJECT CONDITIONS

A. Information on Drawings or in soil investigation report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

PART 2 - PRODUCTS

2.1 FILL AND BACKFILL MATERIALS

A. Fill and backfill material shall be a granular material previously removed from excavation or imported fill material, free of clods and stones larger than 3 inches, (2½ inches for utility trenches) foreign materials, vegetable growths, sod, expansive soils, rubbish and debris. Material shall conform to these specified requirements and related sections.

B. Fill material exhibiting a wide variation in consistency and moisture content shall be blended and aerated to stabilize and upgrade the material.

C. Bedding material from trench bottom to one foot above the pipe:
1. Sand, gravel, crushed aggregate or native free-draining granular material providing a sand equivalent of at least 30 or a coefficient of permeability greater than 1.4 inches per hour.
2. Sand complying with the Specifications for cement concrete aggregates.

D. Brick rubble and broken concrete originating from the Project site shall be legally disposed of off the Project site No such material shall be imported from outside the Project site.

E. Permeable Backfill:
1. Provide permeable backfill material behind retaining structures consisting of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations of these materials conforming to the following gradations:

Sieve Size:	Percentage Passing:
3/4 inch (19mm)	100
3/8 inch (10mm)	80 to 100
No. 100	0 to 8
No. 200	0 to 3

2. Those portions of fill material passing a No. 4 sieve shall provide a sand equivalent of at least 60.
3. Provided backing for weep-holes shall consist of two cubic feet of aggregate in burlap sacks, securely tied. Aggregate shall conform to requirements for No. 3 concrete aggregate as specified in subsection 200-1.4 of the Standard Specifications for Public Works Construction.

4. Permeable Backfill Alternate Materials: Instead of the materials specified for retaining structures backfill, a drainage matting system Miradrain by Mirafi, Inc., American Wick Drain, JDR Enterprises, or equal, may be provided if reviewed and approved by the ARCHITECT.

F. Cement-sand slurry shall be provided with one sack of cement per cubic yard of the mixture.

2.2 BASE MATERIALS

A. Concrete Slabs on Grade: Provide "Crushed Aggregate Base" as specified in Standard Specifications for Public Works Construction, Section 200 - Rock Materials, with 3/4 inch maximum size aggregates. Provide 3 inch thick base, unless noted otherwise.

B. Bituminous Surfacing: Provide as indicated on Drawings and specified in Section 31 23 26 Base Course.

PART 3 - EXECUTION

3.1 GENERAL

A. Before initiating intrusive activities, contact Underground Service Alert of Southern California (USA or Dig Alert) to obtain a Dig Alert ticket for location information on buried public and USA member utilities and pipelines at least 48-hours prior to beginning work. A copy of the Dig Alert ticket shall be forwarded to the OWNER. For on-site utilities, retain a state-licensed third party underground utility locating service.

B. Where the Work includes a building extension or addition on an occupied Project site, perform Work in such a manner, and at such times, as not to disrupt performance of existing utility services to existing Project site facilities. Where an interruption is necessary, obtain review from the OAR before proceeding.

C. Remove concrete or bituminous pavement to straight lines by saw cutting.

3.2 PROTECTION

A. Protect and guard excavations against danger to life, limb, and property as required by, but not limited to, OSHA regulations.

B. Protect existing improvements including landscaping against damage. Repair or replace damaged items.

C. Protect existing utility services and distribution systems from damage or displacement.

D. Remove conduits or pipes not in service, exposed during Work, unless a minimum cover of two feet is provided. Remove concrete, clay or other non-metallic pipe over 8 inches in diameter, unless otherwise indicated.

E. Shore, crib, or lag excavations and earthen banks as necessary to prevent cave in, erosion or gullying of sides.

F. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. If soil becomes soft, soggy, or saturated, excavate to firm undisturbed earth and fill as required. Slope adjacent grades away from excavations to minimize entry of water.

3.3 SHORING

A. Provide shoring as necessary to properly and safely support earth sides of excavations, and existing curbs, sidewalks, gutter, drives and stairs, against movement and collapse.

B. Design and Calculations: Provide in accordance with requirement of governing Cal-OSHA requirements.

C. Remove shoring upon completion of the Work of this Section or when no longer needed unless required otherwise by authorities having jurisdiction.

3.4 EXCAVATION

A. Unclassified Excavations: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork", except as modified herein.

B. Form sides of footings, pads, grade beams, and slab foundations, unless otherwise indicated. Provide excavations of sufficient size to permit installation and removal of forms and other required Work.

C. Machine-drill excavation for round footings to size and depth indicated. Provide a collar or casing, or other adequate protection, to exclude dirt and debris. Protect excavations with plank covers until concrete is placed.

D. Provide excavation bottoms level and free from loose material. Excavate to indicated or required elevations of undisturbed earth.

E. Barricade trenches, ditches, pits, sumps, and similar Work outside the barricaded working area with chain link fence as specified in Section 01 50 00 - Construction Facilities and Temporary Controls, and in accord with Cal-OSHA standards and requirements.

F. Trenches over five feet in depth shall comply with the Construction Safety Orders of the California Division of Industrial Safety.

G. Where indicated or required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.

H. For Utilities:
1. Excavate trenches to required depth for utility lines, such as pipes, conduits, and tanks, with minimum allowance of 6 inches at the bottom and 6 inches at the sides for bedding or concrete encasement as indicated on Drawings. Grade bottom of trenches to a uniform smooth surface. Remove loose soil from the excavation before placing sand bedding or concrete encasement.
2. Do not install piping lengthwise under concrete walks without review by the ARCHITECT.

3. Do not excavate trenches parallel to footings closer than 18 inches from the face of the footing or below a plane having a downward slope of two horizontal to one vertical, from a line 9 inches above bottom of footings.
   a. Unless otherwise indicated on Drawings, depth of excavations outside buildings shall provide for a minimum coverage above top of piping, tank or conduit measured from the lowest adjoining finished grade, as follows:

Plastic Pipe (other than waste)	30 inches below finished grade
Tanks or other structure	36 inches below finished grade
Soil, sewer and storm drain	minimum 18 inches below finished grade, and as required for proper pitch and traffic load. Install polypropylene sewer pipe with at least 24 inches of coverage.
Irrigation Pipe:	Non-pressure pipe - 12 inches, pressure pipe - 24 inches.

   b. Trench width shall provide space for fitting and joining. Excavate for piping bells and fittings, bell and spigot pipe and other fittings.
4. Where portions of existing structures, walks, paving, or other improvements are removed or cut for piping or conduit installation, replace the material with equal quality, finished to match adjoining existing improvements. Repair pavement as specified in Section 32 01 17 - Pavement Repair.
5. Provide a minimum clear dimension of 2 inches from sides of wall excavation to outer surfaces of buried pipes or conduits placed in the same trench or outside surfaces of containers and tanks.

3.5 IMPORT/EXPORT OF MATERIALS

A. Unclassified Fill and Compaction: Comply with the Standard Specifications for Public Works Construction, Section 300 - Earthwork, except as modified herein. Install and compact fill in layers not to exceed 6 inches in thickness.

B. Provide fill materials as specified in Part 2- Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.

C. In addition to the requirements of this Section, import and/or exported materials shall comply with the requirements of Section 01 45 24, Environmental Import/Export Materials Testing.

D. Imported fill materials shall be sampled by the Geotechnical Engineer, for compliance with the requirements of Part 2 of this Section.

E. The Geotechnical Engineer, will submit the samples to an independent DSA approved testing laboratory for testing.

F. Initial sampling and testing shall be performed before importing material to the Project site. Identify the location of the source site in addition to the address, name of the person and entity responsible for the source site. The Geotechnical Engineer, will obtain both the initial and additional samples from the identified site and submit samples for required testing.

G. The Geotechnical Engineer will perform additional sampling during import operations. If the total quantity of import is determined to be greater than 1000 cubic yards of material, one

sample shall be obtained and submitted for testing for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1000 yards, one sample shall be obtained and submitted for testing for each 100 cubic yards of imported material.

H. The independent approved testing laboratory will perform the required tests and report results of tests noting if the tested material passed or failed such tests and will furnish copies to the Project Inspector, ARCHITECT, OAR, DSA, CONTRACTOR, and others as required. Report shall state tests were conducted under the responsible charge of a licensed State of California professional engineer and the material was tested in accordance with applicable provisions of the Contract Documents, California Building Code, and the DSA. Upon completion of the Work of this Section, the independent testing laboratory and Geotechnical Engineer will submit a verified report to the DSA as required by the CBC.

I. Bills of lading or equivalent documentation will be submitted to the Project Inspector on a daily basis.

J. Upon completion of import operations, provide the OAR a certification statement attesting that imported material has been obtained from the identified source site.

3.6 INSTALLATION OF MATERIALS

A. Pavement: Fill or backfill materials shall be installed in horizontal layers of 6 inches, unless otherwise required. Each layer shall be evenly placed and moistened or aerated as necessary. Unless otherwise reviewed by the Geotechnical Engineer, each layer of fill material shall cover the length and width of the area to be filled before the next layer of material is installed. Top surface of each layer shall be installed to an approximate level with a crown or crossfall of at least 1 in 50, but not more than 1 in 20. Provide adequate drainage at all times during installation of the Work of this Section.

B. Utilities:
1. Do not install backfill until the Work of this Section has been inspected and tested. Do not furnish or install materials excavated from the Project site containing materials not permitted for backfill.
2. Backfill electrical or other excavated utility trenches located outside of barricaded installation areas within 24 hours after inspection by the IOR.
3. Install backfill in layers not exceeding 4 inches in thickness, except cement-sand slurry.
4. If materials excavated from the Project site are not permitted for trench backfill in paved areas, backfill trenches with a cement-sand slurry mix. Install backfill to an elevation of the existing undisturbed grades plus one inch.

3.7 COMPACTING

A. Each layer of fill material shall be compacted by tamping, sheepsfoot rollers, or pneumatic-tired rollers to provide specified relative compaction. At inaccessible locations, provide specified compaction by manually held, operated and directed compaction equipment.

B. Install and compact sand bedding to provide a uniform bearing under the full length of piping and conduits.

C. Unless otherwise indicated, compact each layer of fill material to a relative compaction of at least ninety five percent.

D. When fill materials, or a combination of fill materials, are encountered or provided which develop densely packed surfaces as a result of installation or compacting operations, scarify each layer of compacted fill before installing the next succeeding layer.

3.8 INSPECTION AND TESTING

A. The Geotechnical Engineer will inspect and test excavations, sample material quality for testing as set required in Part 2, and observe installation and compaction of fill materials.

B. The Geotechnical Engineer will sample imported fill materials from their designated source and submit samples to the independent approved testing laboratory before delivery to the Project site.

C. Installation of backfill shall be observed by the Geotechnical Engineer.

D. The Geotechnical Engineer will inspect and test excavation Work before the installation of fill and other materials.

E. Compaction: Test compaction in accordance with ASTM D1557, Method C.

F. The Project Inspector will inspect foundation excavations when completed and ready for forms, after forms are in place, and before first placement of concrete.

3.9 PROTECTION

A. Protect the Work of this Section until Substantial Completion.

3.10 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 31 23 16 - EXCAVATION AND FILL FOR PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating, backfill, and compacting for paved areas.
2. Installation of fill materials.

B. Related Requirements:
1. Division 01 - General Requirements.
2. Section 01 45 24 - Environmental Import/Export Materials Testing.
3. Section 31 10 00 - Site Clearing.
4. Section 31 22 00 - Grading.
5. Section 31 23 23 - Excavation and Fill for Utilities.
6. Section 32 23 26 - Base Course.
7. Section 32 01 17 - Pavement Repair.
8. Section 32 12 16 - Asphalt Paving.
9. Section 32 13 13 - Site Concrete Work.

1.2 PROJECT REQUIREMENTS

A. Import and Export of Earth Materials:
1. Fees: Pay as required by authorities having jurisdiction over the area.
2. Bonds: Post as required by authorities having jurisdiction over the area.
3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.3 QUALITY ASSURANCE

A. Comply with Standard Specifications for Public Works Construction, current edition, except as modified herein.

B. Sampling, testing, and certification of imported and/or exported soils shall be performed in accordance with Section 01 45 24 - Environmental Import/Export Materials Testing.

1.4 TESTING

A. OWNER will retain a Geotechnical Engineer as an OWNER Consultant who will provide observations, tests, inspections and approvals identified in the Contract Documents as being responsibility of OWNER.

B. Imported Soils: The Geotechnical Engineer will obtain initial product Sample for testing in accordance Article 3.05 of this Section.

1.5 PROJECT CONDITIONS

A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

PART 2 - PRODUCTS

2.1 BASE MATERIALS

A. Concrete Slabs On Grade: Provide “Crushed Aggregate Base “as specified in the Standard Specifications for Public Works Construction, Section 200: “Rock Materials,” with ¾ inch maximum size aggregates. Provide 3-inch thick base, unless noted otherwise.

B. Bituminous Surfacing: As indicated on Drawings and specified in Section 31 23 26 - Base Course.

2.2 FILL AND BACKFILL MATERIALS

A. Fill and backfill materials shall be previously excavated materials or imported fill material, free of clods and stones larger than 3-inch, foreign materials, vegetable growths, sod, expansive soils, rubbish and debris. Material shall conform to these specified requirements and related sections.

B. Fill material exhibiting a wide variation in consistency and moisture content shall be blended or aerated to stabilize and upgrade the material.

C. Imported Fill Material:
1. Provide suitable materials obtained from Project site excavations for earthwork and fill materials. If excavated materials are not of suitable quality or sufficient quantity, import additional materials as necessary.
2. Imported fill shall be a granular material with sufficient binder to form a firm and stable unyielding subgrade and shall not have more than 60 percent of fines passing 200 mesh sieve. Material shall have a coefficient of expansion of not more than 2 percent from air dry to optimum moisture content and not more than 6 percent from air dry to saturation. Imported material shall be clean and free of rubbish, debris, and toxic or hazardous contaminants. Adobe or clay soils are not permitted.

D. Brick rubble and broken concrete originating from the Project site shall be legally disposed of off the Project site. No such materials shall be imported from outside the Project site.

E. Permeable Backfill:
1. Provide permeable backfill material behind retaining structures consisting of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations of these materials conforming to the following gradations:

Sieve Size:	Percentage Passing:
3/4 inch (19mm)	100
3/8 inch (10mm)	80 to 100
No. 100	0 to 8
No. 200	0 to 3

2. Those portions of fill material passing a No. 4 sieve shall provide a sand equivalent of at least 60.
3. Provided backing for weep holes shall consist of two cubic feet of aggregate in burlap sacks, securely tied. Aggregate shall conform to requirements for No. 3 concrete aggregate as specified in subsection 200-1.4 of the Standard Specifications for Public Works Construction.

4. Permeable Backfill Alternate Materials: Instead of the materials specified for retaining structures backfill, a drainage matting system, Miradrain by Mirafi, Inc., or equal, may be provided if reviewed and approved by the ARCHITECT.

PART 3 - EXECUTION

3.1 GENERAL

A. Before initiating intrusive activities, contact Underground Service Alert of Southern California (USA or Dig Alert) to obtain a Dig Alert ticket for location information on buried public and USA member utilities and pipelines at least 48-hours prior to beginning work. A copy of the Dig Alert ticket shall be forwarded to the OWNER. For on-site utilities, retain a state-licensed third party underground utility locating service.

B. Clear the Project site as indicated in Section 31 10 00 - Site Clearing.

3.2 PROTECTION

A. Protect and guard excavations against danger to life, limb, and property as required by, but not limited to, Cal-OSHA regulations.

B. Protect adjacent existing improvements including landscaping against damage.

3.3 EXISTING UTILITY LINES

A. Protect existing utility lines from damage or displacement.

B. Remove conduits or pipes not in service, exposed during Work, unless a minimum cover of 2 feet is provided. Remove concrete, clay or other non-metallic pipe over 8 inches in diameter, unless otherwise indicated.

3.4 EXCAVATION

A. Unclassified Excavations: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork," except as modified herein.

3.5 FILL

A. Unclassified Fill and Compaction: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork," except as modified herein.

B. Provide fill materials as specified in Part 2 - Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.

C. In addition to the requirements of this Section, import and/or exported materials shall comply with the requirements of Section 01 45 24 - Environmental Import/Export Materials Testing.

D. Imported fill materials will be sampled by the Geotechnical Engineer for compliance with the requirements of Part 2 of this Section.

E. The Geotechnical Engineer will submit samples to a DSA approved independent approved testing laboratory for testing.

F. Initial sampling will be performed by the Geotechnical Engineer before importing material to the Project site. Identify the location of the source site in addition to the address, name of the person and/or entity responsible for the source site. The Geotechnical Engineer will obtain both the initial and additional samples from the identified site and will submit samples to the approved independent testing laboratory for testing.

G. The Geotechnical Engineer will perform additional sampling during import operations. If the total quantity of import is determined to be greater than 1,000 cubic yards of material, one sample shall be obtained and submitted for testing for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1,000 yards, one sample shall be obtained and submitted for testing for each 100 cubic yards of imported material.

H. The independent approved testing laboratory will perform the required tests and report results of tests noting if the tested material passed or failed such tests and will furnish copies to the Project Inspector, ARCHITECT, OAR, DSA, CONTRACTOR, and others as required. Report shall state tests were conducted under the responsible charge of a licensed State of California professional engineer and the material was tested in accordance with applicable provisions of the Contract Documents, CBC, and the DSA. Upon completion of the Work of this Section, the independent testing laboratory and Geotechnical Engineer shall submit a verified report to the DSA as required by CBC.

I. Bills of lading or equivalent documentation will be submitted to the Project Inspector on a daily basis.

J. Upon completion of import operations, provide the OAR a certification statement attesting that imported material has been obtained from the identified source site.

3.6 INSTALLATION OF MATERIALS

A. Fill or backfill materials shall be installed in horizontal layers of 6 inches, unless otherwise required. Each layer shall be evenly placed and moistened or aerated as necessary. Unless otherwise reviewed by the Geotechnical Engineer, each layer of fill material shall cover the length and width of the area to be filled before the next layer of material is installed. Top surface of each layer shall be installed to an approximate level with a crown or crossfall of at least 1 in 50, but no more than 1 in 20. Provide adequate drainage at all times during construction of the Work of this Section.

3.7 COMPACTING

A. Each layer of fill material shall be compacted by tamping, sheepsfoot rollers, or pneumatic-tired rollers to provide specified relative compaction. At inaccessible locations, provide specified compaction by manually held, operated and directed compaction equipment.

B. Unless otherwise indicated, compact each layer of earth fill to a relative compaction of at least 90 percent.

C. When fill materials, or a combination of fill materials, are encountered or provided which develop densely packed surfaces as a result of installation or compacting operations, scarify each compacted layer before installing the next succeeding layer.

3.8 INSPECTION AND TESTING

A. Installation of backfill will be observed by the Geotechnical Engineer.

B. The Geotechnical Engineer will inspect and test excavation Work before the installation of fill and/or other materials.

C. Compaction: Test compaction in accordance with ASTM D1557, Method C.

3.9 PROTECTION

A. Protect the Work of this Section until Substantial Completion.

3.10 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 31 23 23 - EXCAVATION AND FILL FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating, backfilling, and compacting utility trenches such as water, gas, irrigation, storm drain, sewer lines, concrete-encased conduits, and manholes, vaults, valve boxes, catch basins, underground tanks, thrust blocks, yard boxes, pull boxes and other utility appurtenances.

B. Related Requirements:
1. Division 01 - General Requirements.
2. Section 01 45 24 - Environmental Import/Export Materials Testing.
3. Section 31 10 00 - Site Clearing.
4. Section 31 22 00 - Grading.
5. Section 31 23 16 - Excavation and Fill for Paving.
6. Section 32 01 17 - Pavement Repair.
7. Section 32 13 13 - Site Concrete Work.
8. Section 32 84 13 - Potable Water Irrigation.
9. Section 32 84 26 - Reclaimed Water Irrigation.
10. Section 33 40 00 - Storm Drainage Utilities.
11. Division 22 - Plumbing.
12. Division 26 - Electrical.

1.2 PROJECT REQUIREMENTS

A. Import and Export of Earth Materials:
1. Fees: Pay as required by authorities having jurisdiction over the area.
2. Bonds: Post as required by authorities having jurisdiction over the area.
3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.3 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works construction, current edition except as modified herein.

B. Sampling, testing, and certification of imported and/or exported soils shall be performed in accordance with Section 01 45 24 - Environmental Import/Export Materials Testing.

1.4 TESTING

A. OWNER will retain a Geotechnical Engineer as an OWNER Consultant who will provide observations, tests, inspections and approvals identified in the Contract Documents as being responsibility of OWNER.

B. Imported Soils: The Geotechnical Engineer will obtain initial product Sample for testing in accordance Article 3.02 of this Section.

1.5 PROJECT CONDITIONS

A. A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bedding material from trench bottom to one foot above the pipe:
1. Sand, gravel, crushed aggregate or native free-draining granular material providing a sand equivalent of at least 30 or a coefficient of permeability greater than 1.4 inches per hour.
2. Sand complying with the Specifications for cement concrete aggregates.

B. Backfill Materials:
1. Excavated trench material to be installed for backfilling shall be clean, free of large clods, and stones larger than 2 ½-inch in any dimension.
2. Cement-sand slurry shall be provided with one sack of cement per cubic yard of the mixture.
3. Imported Fill Material: Imported fill material shall be a granular material with sufficient binder to form a firm and stable unyielding subgrade and shall not have more than 60 percent of fines passing a 200 mesh sieve. Material shall provide a coefficient of expansion of not more than two percent from air dry to optimum moisture content and not more than six percent from air dry to saturation. Imported materials shall be clean and free of rubbish, debris, and toxic or hazardous contaminants. Adobe or clay soils are not permitted.

PART 3 - EXECUTION

3.1 GENERAL

A. Before initiating intrusive activities, contact Underground Service Alert of Southern California (USA or Dig Alert) to obtain a Dig Alert ticket for location information on buried public and USA member utilities and pipelines at least 48-hours prior to beginning work. A copy of the Dig Alert ticket shall be forwarded to the OWNER. For on-site utilities, retain a state-licensed third party underground utility locating service.

B. Barricade trenches, ditches, pits, sumps, and similar Work outside the barricaded working area with chain link fence as specified in Section 01 50 00, Construction Facilities and Temporary Controls, and in accordance with Cal-OSHA standards and requirements.

C. Saw-cut concrete or bituminous paving for trench installation.

D. Trenches over 5 feet in depth shall conform to the Cal-OSHA.

E. Where indicated and required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.

F. Backfill over excavations to the required elevations with earth, gravel, sand, or concrete and compact as required. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. Slope adjacent grades away from excavations to minimize entry of water.

G. Do not install piping lengthwise under concrete walks without review by the ARCHITECT.

H. Do not excavate trenches parallel to footings closer than 18 inches from the face of the footing or below a plane having a downward slope of two horizontal to one vertical, from a line 9 inches above bottom of footings.

1. Unless otherwise indicated on Drawings, depth of excavations outside the buildings shall allow for a minimum coverage above top of pipe, tank, or conduit measured from the lowest adjoining finished grade, as follows:

Plastic Pipe (other than waste)	30 inches below finished grade
Soil, Sewer & Storm Drain	minimum 18 inches below finished grade, and as required for proper pitch and traffic load. (Install polypropylene sewer pipe with at least 24 inches coverage)
Irrigation Pipe:	nonpressure pipe 12 inches, pressure pipe 24 inches

2. Trench width shall provide ample space for fitting and joining. Excavate for piping bells and fittings, bell and spigot pipe and other fittings.

I. Unless indicated otherwise, excavate trenches to the required depths for utilities, such as pipes, conduit and tanks, with minimum allowances of 6 inches at the bottom and 6 inches at the sides for bedding of unprotected piping or as required for concrete encasement of conduits as indicated on Drawings. Grade bottom of trenches to a uniform smooth surface. Remove loose soil from the excavation before installing sand bedding or concrete encasement.

J. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. If soil becomes soft, soggy, or saturated, excavate to firm undisturbed soil and fill as required. Slope adjacent grades away from excavations to minimize entry of water.

K. Provide a minimum clear dimension of 2 inches from sides of wall excavation to outer surfaces of buried pipes or conduits installed in the same trench or outside surfaces of containers and tanks.

L. Do not install backfill until required inspections and testing is completed.

M. Backfill electrical or other excavated utility trenches located outside of barricaded installation areas within 24 hours after inspection by the Project Inspector.

N. Install backfill materials in layers not exceeding 4 inches in thickness and compact to 90 percent of the maximum density.

O. If materials excavated from the Project site are not permitted for trench backfill in paved areas, backfill trenches with a cement-sand slurry mix. Install backfill to an elevation of the existing undisturbed grade plus one inch.

P. Install and compact sand bedding to provide a uniform full length bearing under piping and conduits.

Q. Where portions of existing structures, walks, paving, or other improvements are removed or cut for piping or conduit installation, replace the material with equal quality, finished to match adjoining existing improvements. Repair pavement as specified in Section 32 01 17, Pavement Repair.

3.2 IMPORT/EXPORT OF MATERIALS

A. Provide fill materials as specified in Part 2, Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.

B. In addition to the requirements of this Section, import and exported materials shall comply with the requirements of Section 01 45 24, Environmental Import/Export Material Testing.

C. Imported fill materials will be sampled by the Geotechnical Engineer for compliance with the requirements of Part 2 of this Section.

D. Initial sampling will be performed by the Geotechnical Engineer before importing material to the Project site. Identify the location of the source site in addition to the address, name of the person and/or entity responsible for the source site. The Geotechnical Engineer will obtain both the initial sample and additional samples from the identified site and shall submit all samples to the approved independent testing laboratory.

E. The Geotechnical Engineer will perform additional sampling during import operations. If the total quantity of import is determined to be greater than 1,000 cubic yards of material, one sample shall be obtained and submitted for testing for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1,000 yards, one sample shall be obtained and submitted for testing for each 100 cubic yards of imported material.

F. The independent approved testing laboratory will perform the required tests and report results of all tests noting if the tested material passed or failed such tests and will furnish copies to the Project Inspector, ARCHITECT, OAR, DSA, CONTRACTOR, and others as required. Report shall state tests were conducted under the responsible charge of a licensed State of California professional engineer and the material was tested in accordance with applicable provisions of the Contract Documents, CBC and the DSA. Upon completion of the Work of this Section, the independent testing laboratory and Geotechnical Engineer will submit a verified report to the DSA as required by CBC.

G. Bills of lading or equivalent documentation will be submitted to the Project Inspector on a daily basis.

H. Upon completion of import operations, provide the OAR a certification statement attesting that imported material has been obtained from the identified source site.

3.3 INSPECTION AND TESTING

A. Compaction test shall be performed in accordance with ASTM D1557, method "C."

3.4 PROTECTION

A. Protect the Work of this Section until Substantial Completion.

3.5 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 31 23 26 - BASE COURSE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Installation of base material.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 01 45 24 – Environmental Import / Export Material Testing.
   3. Section 31 10 00 - Site Clearing.
   4. Section 31 22 00 - Grading.
   5. Section 31 23 13 - Excavation and Fill.
   6. Section 31 23 16 - Excavation and Fill for Paving.
   7. Section 32 01 17 - Pavement Repair.
   8. Section 32 12 16 - Asphalt Paving.
   9. Section 32 13 13 - Site Concrete Work.

1.2 SUBMITTALS

A. Crushed aggregate base (CAB) shall consist of native rock without naturally occurring asbestos or recycled materials. The CONTRACTOR shall submit written documentation, which identifies the source, volume, and proposed transport date of the material for review and approval by OWNER'S Office of Environmental Health and Safety (OEHS) prior to importing the material. A statement on company letterhead from the CAB source, stamped by either a California Professional Geologist or Engineer, which states that the subject materials are native rock, do not contain any recycled materials and that the source quarry does not mine ultramafic materials, a source of natural occurring asbestos shall be included in the submittal to OEHS. The CONTRACTOR may request variance from analytical testing required by Section 01 45 24 for CAB. To be considered for a variance, the CONTRACTOR shall submit a documentation package for OEHS approval, which includes all of the aforementioned information at least 48 hours in advance of planned import.
   1. Frequently used suppliers for LAUSD projects include:
      a. Hansen Aggregates.
      b. Vulcan Materials, Reliance Company.
      c. Vulcan Materials Durbin.

B. Product Data: Submit material source, technical information and test data for base materials. Gradation and quality certifications shall be dated within 30 days of the submittal.

C. Sample: Submit sample of proposed base course material.

1.3 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction, current edition.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Crushed Aggregate Base (CAB) materials shall conform to the requirements of the Standard Specifications for Public Works Construction: Section 200 - Rock Materials.

B. Crushed Miscellaneous Base (CMB) or materials generated on site shall not be used as a base course material.

2.2 MATERIAL APPROVAL

A. Base material shall be inspected by the Project Inspector for gradation and material content prior to installation. The OWNER may choose to have additional tests performed by a geotechnical engineer, retained by the OWNER, before installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install base course material in layers not exceeding 4 inches in thickness, unless required otherwise. Grade and compact to indicated levels or grades, cut and fill, water and roll until the surface is hard and true to line, grade and required section. Provide a relative compaction of at least 95 percent, unless otherwise required.

B. Grade base course to elevations indicated on Drawings, ready to receive surfacing, in accordance with Section 31 22 00 - Grading.

3.2 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.3 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Paving for playground, parking areas, areas between buildings surfacing adjacent to planting and turf areas as indicated.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 31 22 00 - Grading.
   3. Section 32 01 17 - Pavement Repair.
   4. Section 31 23 26 - Base Course.
   5. Section 32 12 36 - Seal for Bituminous Surfacing.
   6. Section 32 13 13 - Site Concrete Work.

1.2 SUBMITTALS

A. Shop Drawings: Submit site plan indicating extent of paving and accessories.

B. Product Data: Manufacturer’s technical data for materials and products.

1.3 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction.

B. ADA related slopes shall be measured with a twenty-four-inch digital level.

1.4 PROJECT CONDITIONS

A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

B. A copy of the soils report is available for examination in the office of the ARCHITECT during regular office hours of the ARCHITECT.

PART 2 - PRODUCTS

2.1 BITUMINOUS MATERIALS

A. Provide materials of the class, grade, or type indicated on the Drawings, conforming to relevant provisions of Section 203 - Bituminous Materials of the Standard Specifications for Public Works Construction.

B. Asphalt Concrete Mix:
   1. Paved slopes: Type III, D, PG-64-10.
   2. Between buildings, playgrounds, parking and fire lanes: Type III, C3, PG-64-10.
   3. Driveways for trash and delivery trucks: Type III, C3, PG-64-10 and Type III, B3, PG-64-10

2.2 HEADERS

A. Concrete: Per specification Section 32 13 13 - Site Concrete Work.

PART 3 - EXECUTION

3.1 HEADERS

A. Concrete Headers:
   1. Install headers along edge of bituminous surfacing as indicated on the Drawings.
   2. Verify that gradients and elevations of base are correct. Maintain subgrade clean and in a smooth, compacted condition until the concrete is placed.
   3. Construct forms, install steel reinforcement and place concrete as indicated on Section 32 13 13 Site Concrete.

3.2 CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT

A. Pavement Thickness: Unless otherwise indicated on Drawings or specified, install bituminous surfacing to a compacted thickness of 2 inches.

B. Base course shall be as specified in Section 31 23 26, Base Course.

C. Surfaces of walls, concrete, masonry, or existing bituminous surfacing indicated to be in direct contact with installed bituminous surfacing shall be cleaned, dried and uniformly coated with an asphaltic emulsion film.

D. Thicken edges of bituminous surfacing that do not abut walls, concrete, or masonry, and at edges joining existing bituminous surfaces. Remove headers at existing bituminous surfacing where new bituminous surfacing is to be installed. Thicken edges an additional 2 inches and taper to the indicated or specified thickness 6 inches back from such edges.

E. At stairways, adjust thickness of paving such that the first tread is equal in height to all other treads.

F. Provide adequate protection for concrete, planting areas, and other finish Work adjacent to areas indicated to receive bituminous surfacing.

G. Placing:
   1. Do not install bituminous surfacing when atmospheric temperature is below 40 degrees F; or when fog or other unsuitable weather conditions are present. Temperature of mixture at time of installation shall not be lower than 260 degrees F in warm weather or higher than 320 degrees F in cold weather.
   2. Where 2-inch or 3-inch thick surfacing is indicated or specified, install surfacing in one course. Where surfacing is indicated or specified 4 inches or more in thickness,

except for thickened edges, install bituminous surfacing in courses of approximately equal thickness, each course not exceeding 2 ½ inches in thickness.

H. Stakes or Screeds: Provide grade or screed stakes spaced not more than 15 feet apart in flow lines with grades of less than one percent. Continuous screeds may be provided instead of stakes.

I. Spreading: Install bituminous surfacing in a manner to cause least possible handling of mixture. In open areas and wherever practicable, install by mechanical means with a self-propelled mechanical spreader. In confined or restricted areas, install mixture with hot shovels and rakes, and smooth with lutes.

J. Joints: Provide vertical joints between successive runs. Install joints true to line, grade, and cross section. Lapped joints are not permitted.

K. Rolling:
1. Finish roll with a self-propelled tandem roller weighing at least 8 tons. Break down roll with a self-propelled roller weighing between 1 ½ tons and 8 tons.
2. Roll in a manner that preserves flow lines and the established finished grades. Break down roll in areas adjacent to flow lines parallel to flow lines. Break down roll after bituminous surfacing is installed without shoving or cracking of mixture under roller. Continue finish rolling until surfacing is unyielding, true to grade, and meets requirements for specified smoothness. Areas inaccessible to finish roller may be finish rolled with breakdown roller or tamped with hot tamping irons and smoothed with hot smoothing irons, hand roller or asphalt plate compactor.
3. Where bituminous surfacing abuts concrete, masonry, walks or paving, tamp joint smooth, if necessary, as described above to obtain a uniformly even joint, true to line and grade. Tamp and smooth to properly compact.
4. Compacted bituminous surfacing shall be provided with a bulk specific gravity of at least 2.31 when tested in accordance with ASTM D1188.

L. Allow bituminous surfacing a thirty day curing time before applying surface seal.

3.3 TOLERANCE

A. Smoothness: Surface of bituminous surfacing after rolling, shall be even, smooth and uniform in texture with no voids or rock pockets, free of roller marks or other irregularities, and not varying by more than 0.03 foot, except at local depressions or raised areas as indicated, when a 10-foot straightedge is placed on surface.

B. Grade: Finished grade shall not vary more than 0.02 foot above or below required grade. Variations within prescribed tolerance shall be compensating so that average grade and cross-section are provided.

3.4 TESTING

A. Asphalt Pavement to Receive Solar Reflective Coating:
1. After asphalt paving has been installed and after a 24 hour period, flood test entire area in presence of the Project Inspector. Inspect area after waiting one hour. Entire area tested shall be free of standing water or puddles in excess of 0.01 foot. Practical field measurement 0.01 foot = two quarters stacked. Repair areas of standing water or puddles and flood test locally; install surface seal and retest as necessary.

2. No seals are to be applied to areas of asphalt paving that are to receive solar reflective coatings.

B. Asphalt Pavement to Receive Bituminous Seal: refer to Section 32 12 36 Seal for Bituminous Surfacing.

3.5 SURFACE SEALING

A. Refer to Section 32 12 36 - Seal for Bituminous Surfacing.

B. Where indicated, provide multiple coats of surface seal to existing bituminous surfacing.

C. Where new bituminous surfacing joins existing bituminous surfacing, overlap surface seal a minimum of 12 inches onto existing bituminous surfacing.

3.6 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.7 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 32 12 36

SEAL FOR BITUMINOUS SURFACING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Surface sealer over bituminous surfacing.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 32 01 17 - Pavement Repair.
3. Section 32 12 16 - Asphalt Paving.
4. Section 32 17 23 - Pavement Marking.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product information and application procedures for bituminous surfacing.

1.03 QUALITY ASSURANCE

A. Comply with the Standard Specifications For Public Works Construction, current edition.

B. Agitate bulk materials during transport.

1.04 MAINTENANCE

A. Extra Materials: Provide 10 gallons in unopened containers.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide one of the following surface seals:

Product Name	Manufacturer

1.	Guard-Top	CALMAT / Industrial Asphalt
2.	Over Kote	Diversified Asphalt Product
3.	Park Top	Western Colloid Products
4.	Sure Seal	Asphalt Coating Engineering
5.	Super Drive Top.	SAF– T Seal. Inc.
6.	Equal.	

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Thoroughly wash surfaces with water to remove dirt, debris, excessive oil and grease, or other foreign matter.

3.02 APPLICATION

A. Install seal coat in strict accordance with manufacturer's written directions and recommendations.

B. Install two coats of surface seal to new bituminous surfacing. First coat shall be installed before flood testing. Clean surface and allow to dry before installing second coat. Second coat shall be installed after bituminous surfacing has passed flood test.

C. Where new bituminous surfacing is installed adjacent to existing bituminous surfacing, overlap surface seal a minimum of 12 inches onto existing bituminous surfacing.

D. Where existing bituminous surfacing is indicated to be patched and sealed, install two coats of surface seal after patching. Refer to Section 32 12 16 - Asphalt Paving.

3.03 PROTECTION OF SURFACES

A. Protect sealed and unsealed surfaces from damage and traffic during performance of the Work of this section and until surface seal has thoroughly set and cured. Do not permit traffic of any kind for at least 24 hours after completion of installation.

B. Protect the Work of this section until Substantial Completion.

3.04 TESTING

A. OWNER reserves the right to obtain samples, perform tests to ensure compliance with the Specifications, and to review weight slips and invoices of materials delivered to the Project site.

B. After first coat of surface seal has been installed and after a 24-hour period, flood test entire area in presence of the Project Inspector. Inspect area after waiting one hour. Entire area tested shall be free of standing water or puddles in excess of 0.01 foot. Practical field measurement: 0.01 foot = two quarters stacked. Repair areas of standing water or puddles and flood test locally; install surface seal and retest as necessary.

3.05 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 32 13 13 - SITE CONCRETE WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: On-site concrete work:
1. Portland cement concrete pavement, driveways, curbs and mowing strips.
2. Stairs on grade.
3. Footings for fence posts, bollards, flagpoles, shade structures, light standards and athletic and playground equipment.
4. Pipe encasements, thrust blocks, and equipment pads.
5. Retaining walls, planter walls and concrete benches.

B. Related Requirements:
1. Division 01 - General Requirements.
2. Section 03 10 00 – Concrete Forming and Accessories.
3. Section 03 20 00 - Concrete Reinforcement.
4. Section 03 30 00 – Cast-in-Place Concrete.
5. Section 03 38 00 – Post Tensioned Concrete Slab - Tennis Courts.
6. Section - 05 5100 Metal Stairs.
7. Section 07 92 00 – Joint Sealants.
8. Section 11 68 13 – Playfield Equipment and Structures – Primary Centers and Elementary Schools.
9. Section 11 68 16 – Playfield Equipment and Structures – Middle and High Schools.
10. Division 23 - HVAC.
11. Division 26 - Electrical.
12. Section 31 22 00 – Grading.
13. Section 31 23 16 - Excavation and Fill for Pavement.
14. Section 31 23 26 - Base Course.
15. Section 32 12 16 - Asphalt Paving.
16. Section 32 17 23 – Pavement Markings.
17. Section 32 31 13 - Chain Link Fences and Gates.
18. Section 33 40 00 - Storm Drainage Utilities.

1.2 REFERENCES

A. Structural work, such as retaining walls, planter walls, cast-in-place benches, equipment pads, and footings for playground equipment, fences, walls, shade structures and flagpoles shall conform to the following Sections:
1. Section 03 10 00 Concrete Forming.
2. Section 03 20 00 Concrete Reinforcing.
3. Section 03 30 00 Cast-in-Place Concrete.

B. Flatwork, such as walkways, driveways, ramps and steps on grade, swales, curbs, mow strips and utility related concrete, conform to:
1. Standard Specifications for Public Works Construction, The “Greenbook”, except reclaimed aggregates and processed miscellaneous base are not allowed.

C. Imported or exported earthwork shall conform to Section 01 45 24 Environmental Import / Export Materials Testing.

D. National Ready Mixed Concrete Association (NRMCA):

1. Checklist for the Concrete Pre-Construction Conference.

1.3 QUALITY ASSURANCE

A. Source Limitations for Exposed Concrete: Obtain each color, size, type, and variety of concrete material and concrete mixture from single manufacturer with resources to provide concrete of consistent quality in appearance and physical properties. Secure material required for the duration of the project as needed to ensure consistent quality in appearance.

B. Pre-Installation Conference:
1. CONTRACTOR shall coordinate and conduct pre-installation conference in conformance to Section 01 31 19 Project Meetings.
2. CONTRACTOR shall use the NRMCA “Checklist for the Concrete Pre-Construction Conference” as the meeting agenda.

C. Mockup:
1. Build 8 feet by 8 feet mockups of full-thickness sections of concrete paving using processes and techniques intended for use on permanent work, including curing procedures.
2. Build mockups to demonstrate typical joints; surface finishes and standard of workmanship.
3. Obtain ARCHITECT’s approval of mockup before proceeding with work of this Section.
4. Mockup shall remain through completion of the work for use as a quality standard for finished work.
5. Remove mockup when directed by the OAR.

D. Field applied primers, paintings, sealers, sealants, caulking, leveling and patching compounds, crack/joint repair compounds adhesives and similar products shall be approved by the OWNER’s Office of Environmental Health and Safety (OEHS).

E. ADA related slopes shall be measured with a twenty-four-inch digital level.

1.4 SUBMITTALS

A. Structural Work: Conform to the applicable requirements of Sections 03 10 00 Concrete Forming, 03 20 00 Concrete Reinforcing and 03 30 00 Cast-in-Place Concrete.

B. Flatwork: Submit mix design in conformance to the Greenbook.

C. Shop Drawings: Submit drawings indicating the locations of concrete joints, including construction joints, expansion joints, isolation joints, and contraction joints.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store cement and aggregate materials so to prevent their deterioration or intrusion by foreign matter. Deteriorated or contaminated materials shall not be furnished.

B. Packaged materials shall bear the manufacturers and brand name label and shall be stored in their original unbroken package in a weather tight place until ready for use in the work.

C. Avoid exposure of reinforcing steel bars, wire, and wire fabric to dirt, moisture or conditions harmful to reinforcing.

D. Reinforcing steel bars, wire, and wire fabric shall be stored on the Project site to permit easy access for examination and identification of each shipment. Material of each shipment shall be separated by size and shape.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Work: Conform to the applicable requirements of the following Sections, except as otherwise specified:
1. Section 03 10 00 Concrete Forming.
2. Section 03 20 00 Concrete Reinforcing.
3. Section 03 30 00 Cast-in-Place Concrete.
4. Section 07 92 00 Joint Sealants.

B. Flatwork: Conform to the applicable requirements of the Greenbook, Section 201, except as follows:
1. Water/cement ratio for concrete flatwork shall be 0.50 maximum.
2. Base course shall conform to Section 32 32 26 Base Course.
3. Reclaimed concrete material shall not be used.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that gradients and elevations of base are correct. Maintain subgrade clean and in a smooth, compacted condition until the concrete is placed.

B. Maintain subgrade in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. Earth surface shall be kept moist by frequent sprinkling up to the time of placing concrete.

3.2 CONSTRUCTION OF FORMS

A. Flatwork Forming: Set forms to the indicated alignment, grade and dimensions. Hold forms rigidly in place by a minimum of 4 stakes per form placed at intervals not to exceed two feet. Use additional stakes and braces at corners, deep sections, and radius bends, as required. Use clamps, spreaders, and braces where required to ensure rigidity in the forms.

B. Wall Formwork: Forms shall be constructed to conform to final concrete shape, lines and dimensions of members required by Drawings and Specifications. Forms shall be sufficiently tight to prevent leakage of concrete and properly braced or tied together to maintain position and shape.

3.3 STEEL REINFORCEMENT INSTALLATION

A. Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials. Do not heat reinforcement for bending. Bend bars No. 6 size and larger in the shop only. Bars with unscheduled kinks or bends are not permitted.

B. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

C. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces, and lace splices with wire.

D. Clean reinforcement of loose rust and mill scale, earth, or bond-reducing materials.

3.4 PREPARATION FOR CONCRETE PLACEMENT

A. Surfaces to receive concrete shall be free of debris, standing water, and any other deleterious substances before start of concrete placing.

B. Do not place concrete until forms, reinforcement, pipe, conduits, outlet boxes, anchors, sleeves, bolts, and other embedded materials are securely fastened in place. Maintain a minimum of two inches clearance between said items and any part of the concrete reinforcement.

C. Adjust pull boxes, meter boxes, valve covers and manholes to proposed finish grade prior to placement of concrete. Anchor bolts shall be accurately set and maintained in position by templates while being embedded in concrete.

D. Clean thoroughly the surfaces of metalwork to be in contact with concrete, remove dirt, grease, loose scale and rust, grout, mortar, and other foreign substances before the concrete is placed.

E. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

3.5 CONCRETE PLACEMENT

A. Place, compact, screed, float and trowel concrete as indicated in Section 03 30 00 Cast-in-Place Concrete.

B. Finish: After straightedging, when most of the water sheen has disappeared and just before the concrete hardens, finish the surface with a wood or magnesium float or darby to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. Produce a scored surface by brooming with a fiber-bristle brush in a direction transverse to that of the traffic, followed by edging.
   1. Provide medium broom finish on surfaces up to six percent slope by striating surface 1/32 to 3/64 inch deep with a soft bristle broom across concrete surface to provide a uniform fine line texture.
   2. Provide heavy broom finish on surfaces over six percent by striating surface 1/16 inch to 1/8 inch deep with a stiff-bristled broom.

3.6 JOINTS

A. Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated. Align curb and sidewalk joints.

B. Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour.
   1. Continue steel reinforcement across construction joints unless otherwise indicated on the Drawings.
   2. Provide tie bars at sides of paving strips where indicated on the Drawings
   3. Butt Joints: Use bonding agent or epoxy-bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
   4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
   5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated on the Drawings.

D. Expansion Joints:

1. Provide premolded joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together. Extend expansion joint fillers full-width and depth of joint, and 1/4" below finished surface where joint filler is indicated. If no joint sealer is indicated place top of premolded joint filler flush with top of concrete or curb.
2. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

E. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints to a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Remove grooving-tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

F. Edging: After initial floating, tool edges of paving, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Remove edging-tool marks on concrete surfaces.

G. Where concrete is to be cast against old concrete, (greater than 60 days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by sand-blasting, exposing the aggregate. The hardened surface shall be cleaned of latent foreign material and washed clean, prior to the application of an epoxy bonding agent.

3.7 STAIRS

A. Install support post sleeves into the perimeter concrete curbing during the installation process of the curbing. Sleeves shall be three-inch diameter, schedule 40 PVC with a cap solvent welded to the bottom of the sleeve. Drill a half-inch weep hole on the bottom of the cap. Sleeve and cap shall be Nibco products or approved equal. Sleeves shall be embedded into concrete a minimum of nine inches and spaced at a maximum of four feet, or as indicated on the Drawings. Fill sleeve with non-shrink grout Quickcrete #1585-01 when setting posts. Provide control joints into the concrete on both sides for each post.

B. Finish step nosings with a safety step edger/groover with a 1/2 inch radius and four grooves spaced equally 3/4 inch on center and a bit depth between 1/4 to 3/8 inch. Paint with contrasting color.

3.8 CURB CONCRETE PLACEMENT AND FINISHING

A. Formed Curb: Place concrete to the required section in a single lift. Consolidate concrete using approved mechanical vibrators.

B. Concrete Finishing: Float and finish exposed surfaces with a smooth wood float until true to grade and section and uniform in texture. Brush floated surfaces with a fine-hair brush using longitudinal strokes. Round the top of the curb with an edging tool to a radius of 1/2 inch. Immediately after removing the front curb form, rub the face of the curb with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. Brush the front curb surface, while still wet, in the same manner as the curb top.

C. Surface and Thickness Tolerances: Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.9 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project Site.

3.10 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 32 14 13 - PRECAST CONCRETE UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes, but Is Not Necessarily Limited to:

1. Pedestrian Precast Pavers

B. Related Work:

1. Concrete Paving
2. Planting Irrigation
3. Planting

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C33: "Specification for Concrete Aggregates."
2. C67: "Method of Sampling and Testing Brick and Structural Clay Tile."
3. C136: "Method for Sieve Analysis for Fine and Coarse Aggregates."
4. C140: "Method of Sampling and Testing Concrete Masonry Units."
5. C144: "Standard Specification for Aggregate for Masonry Mortar."
6. C936: Specification for Solid Concrete Interlocking Paving Units."
7. C979: "Standard Specification for Pigments for Integrally Colored Concrete.

B. Interlocking Concrete Pavement Institute (ICPI):

1. ICPI Tech Spec Technical Bulletins

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

A. Pavers shall provide a solid and even walk surface, free of bumps and depressions.

B. All products shall be compatible with one another and with other specified products with which they may come in contact.

C. When installed on structure over waterproofing, system shall meet UL Class A requirements.

D. Slip Resistance: Exposed walk surfaces of pavers shall have a minimum wet and dry coefficient of friction of 0.60 when tested in accordance with ASTM C1028. Test report shall indicate six results; wet and dry conditions for leather, neolite, and rubber.

E. Pavers shall meet the following requirements set forth in ASTM C936:

1. Minimum average compressive strength: 8,000 psi. in accordance with ASTM C140.
2. Average absorption of 5 percent when tested in accordance with ASTM C140.
3. Resistance of 50 freeze-thaw cycles, when tested in accordance with ASTM C67.

1.4 SUBMITTALS

A. Shop Drawings:

1. Show layout of pavers and location of mechanical, electrical, and architectural items in paver areas.
2. Provide details showing each setting method and interface with adjacent construction.

B. Product Data: Manufacturer's specifications and installation instructions.

C. Verification Samples:

1. Paving stone in style and color specified.
2. Edge restraint, if specified.
3. Geotextile, 12 inches square.
4. Bedding and joint sand.
5. Grade rock base.

D. Quality Control:

1. Statement of installer qualifications.
2. Certified laboratory or field tests for slip resistance as specified.
3. Certified laboratory tests verifying that pavers meet specified requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Documented experience installing unit pavers and related products; and certified by the Interlocking Concrete Paver Institute.

B. Contractor, Installer, Owner and Landscape Architect’s attendance is required at pre-installation meeting.

C. Submittals and Mock-ups:

1. For landscape and vehicular pavers, install a paver area approximately five (5) feet square or as otherwise directed by the Landscape Architect or Owner.

a. This area will be used to determine surcharge of bedding, joint sizes, lines, laying patterns, edge treatment, and texture.

2. For paver assembly in courtyard and deck areas, first installed example of each installation condition shall serve as a mock-up for review and approval of workmanship, visual effect, and interface with adjacent construction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Deliver concrete pavers to the site in steel-banded, plastic-banded or plastic-wrapped cubes capable of transfer by forklift.
2. Unload pavers at the site in such a manner that no damage occurs to the product.

B. Handling:

1. Handle pavers to prevent chipping, breakage, soiling or other damage.
2. Do not use pinch or wrecking bars without protecting edges of pavers with wood or other rigid materials.

3. Lift with wide-belt type slings wherever possible; do not use wire rope or ropes containing tar or other substances which might cause staining.
4. If required, use wood rollers and provide cushion at end of wood slide.

C. Storage:

1. Store materials under cover, clear of the ground and protected from the weather.
2. Store pavers on wood skids or pallets.
3. Place and stock skids and pavers to distribute weight evenly and to prevent breakage or cracking.
4. Protect stored pavers from weather with waterproof non-staining covers or enclosures, but allow air to circulate around pavers.
5. Cover sand with waterproof covering to prevent exposure to rainfall or removal by wind. Weight cover as required.

1.7 PROJECT CONDITIONS

A. Do not install sand or pavers during rain.

B. Do not install pavers on saturated sand.

C. Coordinate edge treatment with installation of adjacent construction.

1.8 WARRANTY

A. Provide a two (2) year warranty against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE PAVERS

A. Pavers:

1. Manufacturer: As specified on Plans, shall be ICPI member.
2. Color(s): As specified on Plans and per Approved Mock-up.
3. Size: As specified on Plans and per Approved Mock-up.
4. Setting Pattern: As specified on Plans and per Approved Mock-up.

2.2 OTHER MATERIALS

A. Geotextile (Filter Fabric): Woven or non-woven geotextile manufactured from polyester or polypropylene fibers, with a permeability rating ten (10) times greater than that of soil on which paving is founded and an AOS (apparent opening size) small enough to prevent passage of fines from leveling course into graded aggregate of base course below.

B. Drainage Composite: As specified on Drawings.

C. Bedding and Joint Sand:

1. Clean, non-plastic, free from deleterious or foreign matter.
2. Sand shall be symmetrically shaped, natural or manufactured from crushed rock.
3. Do not use mason sand or sand conforming to ASTM C 144 for the bedding sand.

4. Where concrete pavers are subject to vehicular traffic, utilize sands that are as hard as practically available.
5. Sieve in accordance with ASTM C136.
6. Conform to the following grading requirements of ASTM C33:

Sieve Size	Percentage Passing
3/8-inch	100
No. 4	95 to 100
No. 8	85 to 100
No. 16	50 to 85
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10
No. 200	0 to 1

D. Graded Rock Base: Class 2 aggregate as specified in plans or Geotechnical Report.

E. Lifting Devices for Pavers: As provided or recommended by manufacturer of pavers for future removal and maintenance of pavers by the Owner.

F. Sealer: BP Pro Joint Sand Stabilizer (Enhanced)

PART 3 - EXECUTION

3.1 EXAMINATION

A. General Contractor shall inspect, accept and certify in writing to the paver installation subcontractor that site conditions meet specifications for the following items prior to installation of interlocking concrete pavers.

1. Verify that substrate is dry and ready to support sand, pavers and imposed loads.
2. Verify gravel base has been compacted as required by Geotechnical Report.
3. Verify that gradients and elevations of substrate are correct.
4. Provide written density test results for soil subgrade base materials.
5. Verify location, type, installation, and elevations of edge restraints around perimeter of area to be paved.

B. Do not proceed with installation of bedding sand and interlocking concrete pavers until base conditions are corrected.

3.2 PREPARATION (ON GRADE)

A. Install geotextile over substrate. Overlap edges by 12 inches, and seal laps. Turn up at drains to prevent sand from entering drain.

B. Spread sand evenly over substrate. Screed to depth of approximately one (1) inch to 2 (2) inches, unless otherwise required to comply with finished level shown.

1. Do not disturb screeded sand.
2. Place sufficient sand to stay ahead of the laid pavers.
3. Screeded area shall not substantially exceed that which is covered by pavers in one day.

4. Do not use bedding sand to fill depressions in the base surface.

C. Ensure that pavers are free of foreign materials before installation.

3.3 INSTALLATION OF PAVERS

A. Lay pavers in patterns shown in Drawings, to achieve overall surface design. Maintain straight pattern lines.

B. Joints between pavers, and between pavers and adjacent construction, shall be between 1/16 inch and 1/8-inch wide.

C. Joint (bond) lines shall not deviate more than ±1/2 in. over 50 feet from string lines.

D. Fill gaps at edges of paved area with cut pavers or edge units. Cut edge pavers with a double-bladed splitter or masonry saw.

E. Expansion and Control Joints: Provide joints at locations and of widths indicated. Before setting pavers, fill with joint filler. Make top of joint filler flush with top of pavers.

F. Pavers over Waterproofing: Exercise care in placing pavers and setting materials over waterproofing so that protection and drainage panel materials are not displaced and waterproofing is not punctured or otherwise damaged.

1. Carefully replace materials that become displaced.
2. If waterproofing is damaged repair before covering with pavers.
3. Provide joint filler at waterproofing that is turned up on vertical surfaces; or provide temporary filler or protection until paver installation is complete.

G. Install top of pavers flush with adjacent walk surfaces, in such a way as to avoid a tripping hazard condition.

3.4 SAND JOINTS (ON GRADE)

A. Vibrate pavers, sweeping dry sand into joints and vibrating until they are full.

1. Use a low-amplitude plate compactor capable of at least minimum of 4,000 lbf (18 kN) at a frequency of 75 to 100 Hz to vibrate the pavers into the sand. Remove any cracked or damaged pavers and replace with new units.
2. This will require at least two (2) or three (3) passes with the vibrator.
3. Do not vibrate within three (3) feet of unrestrained edges of paving units.
4. Work within six (6) feet of the laying face shall be left fully compacted with sand-filled joints at the completion of each day. Cover the laying face or any incomplete areas with plastic sheets overnight if not closed with cut and compacted pavers with joint sand to prevent exposed bedding sand from becoming saturated from rainfall.

B. Remove excess sand from surface when installation is complete.

3.5 FIELD QUALITY CONTROL

A. Final surface elevations shall not deviate more than 3/8-inch under a ten (10) foot-long straightedge. Adjust installation as required to conform to required elevations.

B. Surface elevation of pavers shall be 1/8-inch to 1/4-inch above adjacent drainage inlets, concrete collars or channels.

C. See Drawings for requirements of edge treatment.

3.6 SEALER

A. Product Description:
A.
1. BP Pro Enhancing Stabilizing Sealer is designed specifically for use on block paving to stabilize joint sand and seal the paver surface. It is a water-based single component polymer that penetrates into the pores and seals the surface with a coating that gives you a semi-gloss finish.
2. Enhancing Stabilizing Sealer is a green product that is solvent free and environmentally friendly. It is VOC, EPA, OSHA, and FDA compliant. It is non-hazardous and non-toxic.
3. It has the consistency of water and a milky white appearance with a slight odor when in its liquid state and dries to clear semi-gloss finish.
4. It can be used in-doors and out-doors on new and existing projects because it is safe and UV stable.
5. Enhancing Stabilizing Sealer has good coverage and can be applied immediately after pavement completion because it will not trap efflorescence, and it will not whiten. The product is easy to install and offers increased stain protection and reduces the formation of efflorescence. Cured product is heat and freeze resistant.
1.

B. Drying Time:

1. The following will be effected by weather and surface conditions, so take these factors into consideration:
2.

3. Dry Time	4. 30 minutes – three (3) hours, surface should be dry to the touch
5. Cure Time	6. 24-Hours for initial joint sand stabilization which occurs quickly, but complete curing will take additional time.
7. Vehicle and Precipitation	8. 24-Hours

9.

C. Surface Preparation:
B.
1. All surfaces must be cleaned, free from efflorescence and loose debris including dust and plant material prior to application of a BP Pro sealer product. The surface and the joint sand should be thoroughly dry. If the surface or joint sand contains moisture, this could affect the look of the material on the surface when it dries or penetrates into the joint sand impacting the joint sand stabilization itself.
2. On older pavements and walls, cleaning must be carried out and the surface must be dry to allow proper penetration of the materials into the substrate and to provide the best aesthetic results.
3. In some cases, it is necessary to remove existing sealers, penetrating or film forming, prior to carrying out the work.
4. The paver joint should be completely filled with dry, correctly graded ASTM C-144 jointing sand with the top level not exceeding the bottom of the chamfer or 1/8 inch below the surface on a tumbled paver surface.
5. A leaf blower is the recommended method to remove dust and fine sand particles from the surface and achieve the optimum joint sand height.

6. It is recommended to use BP Pro cleaners created specifically for these surfaces and stains based on each unique condition and follow the specific instructions to accomplish your cleaning goals and properly prepare the surface.

C.

D. Application Information:

D.

1. BP Pro Enhancing Stabilizing Sealer should be heavily flood coated onto the pavement to saturate the surface and joint sand to achieve the optimum surface seal and penetration to stabilize the joint sand. This flood coating can best be achieved by a low pressure high volume electric fluid pump (example, sump pump) or on small projects by using a pump-up sprayer.
2. Use (Coverage Guidelines) to ensure that you use the correct amount of material for your project and divide it into measured sections to ensure that it is applied as uniformly as possible. You must apply sufficient material to the surface to achieve joint sand saturation and penetration beginning the process of joint sand stabilization.
3. A squeegee should be used to remove pooling and excess material from the surface and direct it into the joint sand to get better penetration.
4. This is particularly important on projects subject to multiple vehicle high-speed traffic loadings, aggressive cleaning regiments or in freeze-thaw climates.
5. Additional applications can be carried out to increase the coating offering a higher gloss and better stain resistance. Care should be taken to avoid over applications (see Precautionary Information) to understand risks and BP Pro Griprite can be used to add texture to the surface and increase traction. Applications should cease in inclement weather including precipitation, high winds and excessive heat and cold.
6. Material should not freeze in its liquid state during its curing process as this may impact the effectives of the joint sand bond.
7. Clean all application equipment with water and do not allow material to dry in containers as removal becomes more difficult. Recommended is the BP Pro application equipment including the Kit that does 3,000 – 6,000 square feet per hour, the Cart that does 1,000 – 3,000 square feet per hour, and a Pump Sprayer that does 500 – 1,500 square feet per hour.
8. Contact information for BP Pro Sealer Products is: 866-612-7776, or visit the website at: www.BPpro.biz, for more information.

E. Coverage Guidelines*:

Surface:	sf/gal	sm/l
Block Paving	75-150	1.8 to 3.7
Retaining Walls **	50-200	1.2 to 4.9
Block Walls	75-150	1.8 to 3.7
Brick Masonry	150-300	3.7 to 7.4
Manufactures Stone	150-300	3.7 to 7.4
Concrete Surfaces	150-400	3.7 to 7.4

* Actual coverage may vary depending on the type, age, condition, joint size, and porosity of the surface, application method and other local conditions like excessive heat. These coverage rates are to our best knowledge, accurate and true.

** Double application suggested on these surfaces.

E.

F. Storage and Handling:

F.

1. Containers should be properly sealed and protected from freezing. Temperature should range between 50°F – 100°F.

1.

G. Precautionary Information:

1. Excessive applications or over-applications can cause surfaces to become slippery and cause undesirable aesthetic results. Stains and moisture should not be present prior to application, as it can also impact the performance and look of the product.

2.

2. Testing is always recommended to ensure both proper physical and aesthetic properties prior to starting a project. Never try to seal wet or damp surfaces. A minimum temperature of 45° F must be maintained for 24-hours prior to application. Working time is reduced when temperatures are above 90° F, so it is recommended that sealing take place during cooler temperatures. Work shall cease in inclement weather.

3.

3. Use adequate ventilation and wear protective clothing, eyewear, gloves and breathing aids when working in confined spaces. Harmful if swallowed, inhaled or absorbed through skin. Wash hands thoroughly after handling and keep containers closed when not in use. Avoid breathing vapor mist and avoid direct contact with skin.

3.7 PROTECTION

A. After work in this section is complete, the General Contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.

END OF SECTION 32 14 13

SECTION 32 84 00 – PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Contractor shall furnish all labor, materials, equipment and services necessary to install the irrigation system indicated on the approved drawings and specified herein and shall perform all other incidental work necessary to carry out the intent of this Specification and drawings including the following:

1. Furnish and install all pipe lines and fittings.
2. Furnish and install automatic controller, remote control valve wiring, all electrical connections, and conduits.
3. Furnish, assemble, install material described in this specification and as indicated on the drawings, and final adjustments as determined by the Architect to insure efficient and uniform distribution of the irrigation system.
4. Excavate and backfill trenches.
5. Test and inspection of the irrigation system.
6. One (1) year guarantee.

1.2 QUALITY ASSURANCE

A. General:

1. Carefully check all grades and existing utilities to determine that work may safely proceed, keeping within the specified material depths with respect to finish grade and drainage.
2. Verify that irrigation systems shall be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer’s recommendations.
3. Inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Water Service: Water service is existing.

C. Electrical Service:

1. Electrical service is existing. Do not install the irrigation system as shown on the construction

drawings when field conditions such as physical obstructions, grading discrepancies and field dimensions vary from those recorded on the construction drawings. Immediately bring any such discrepancies to the attention of the Architect prior to proceeding with work. If immediate notification is not given and such discrepancies exist, the Contractor shall assume full responsibility for necessary revisions, as determined by the Owner.

2. All central control system communication cable installation and splicing or radio communication shall be tested and certified in writing by the appropriate manufacturer’s representative and shall also be tested on line with the central computer system prior to beginning the Maintenance period.

D. Codes and Standards: In addition to complying with all current local agency (ices) codes and regulations, comply with the latest rules of the National Electrical Code and the Electrical Safety Orders of the State of California, Division of Industrial Safety, for all electrical work and materials.

E. Physical Layout:
1. The drawings are diagrammatic. All scaled measurements are approximate. Before proceeding with the work, the Contractor shall ascertain all dimensions at the job site. Provide offsets in piping and changes in equipment locations as necessary to conform to structures and to avoid obstructions or conflicts with other work.
2. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads, make minor adjustments required due to differences between site and drawings. Where piping is shown on drawings under paved areas but running parallel and adjacent to planted areas, install the piping in planted areas. All layouts shall be certified by the irrigation system designer and approved by the Owner prior to installation.
3. Contractor shall coordinate the installation of all irrigation material with the landscape drawings to avoid interfering with existing or new plants.
4. Irrigation head spacing as shown on the drawings shall not be exceeded.

F. Existing Field Conditions:
1. Preserve and protect all existing trees, plants, monuments, structures, hardscape and architectural elements form damage due to work in this section. In the event that damage does occur to inanimate object and structures, the Contractor will repair or replace such damage to the satisfaction of the Owner or Owner’s representative. Damage or injury to living plant material will be replaced by the Contractor at the Contractor’s expense.
2. Trenching or other work required in this section under the limb spread of existing trees shall be done by hand or by other methods so as to prevent damage or harm to limbs, branches and roots.
3. Trenching in areas where root diameter exceeds two (2) inches shall be done by hand. Exposed roots of this size shall be heavily wrapped with moistened burlap to avoid scarring or excessive drying. Where a trenching machine is operated in proximity to roots that are less than two (2) inches, the wall of the trench shall be hand trimmed, making clean cuts through roots.
4. Trenches adjacent to or under existing trees shall be closed within 24 hours, and when this is not possible, the side of trench closest to the tree or trees affected shall be covered with moistened burlap.
5. Protect, maintain and coordinate work with other contracts, specifications, trades and utilities. Extreme care shall be exercised in excavating and working in the area due to existing utilities. Contractor shall be responsible for damages caused by their operations. In the event that damage does occur, the costs of such repairs shall be paid by the Contractor unless other arrangements have been made with the Owner.

Use caution where trenches and piping cross existing roadways, sidewalks, hardscape, paths or curbs. In the event that damage does occur, the Contractor will repair such damage at the Contractor’s expense.

G. Required Documents:

1. Submittals:

a. Submit pdf of submittal book that includes all irrigation equipment to be used, manufacturer’s brochures, service manuals, guarantees, and operating

instructions for approval to the Architect prior to beginning of work. Submittals should be in a bound form complete with table of contents. The Contractor shall not proceed with work in the field until this submittal is approved in its entirety by the Landscape Architect's irrigation designer.

2. Service Manuals:

   a. The Contractor shall furnish a service manual to the Owner prior to scheduling a walk through for substantial completion. Manual shall be submitted in a bound form complete with a table of contents, copy of Contractor's warranty, and workmanship form on company letterhead and shall contain complete enlarged drawings of all equipment installed showing component warranties and catalog numbers together with the manufacture's name and address. Manual shall include operation instructions. Manuals shall be subject to approval by the Owner or Owner's representative as to completeness.

3. Record and As-Built Drawings:

   The Contractor shall maintain as-built drawings on the job site at all times. Contractor shall record accurately on one set of as-built drawings all changes in the work constituting departures from the original approved drawings. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the Owner. Dimensions shall be from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavements, etc.).

   Data to be shown on as-built drawings shall be recorded day to day as--the project is being installed. All lettering on drawings shall be minimum 1/10-inch in size. The as-built drawings shall show the locations and depths of the following items:

   a. Points of connection
   b. Routing of pressure lines (dimension at least every 100 feet along routing)
   c. Gate valves
   d. Remote control valves
   e. Quick coupling valves
   f. Routing of control wires
   g. Pressure regulator, strainer, assembly
   h. Water and electric meters
   i. Controller assemblies
   j. Irrigation pull boxes/splice boxes
   k. Cluster control units
   l. Sleeves
   m. Related equipment
   n. Central control field components
   o. Any other equipment deemed necessary by Landscape Architect

1.3 SUBMITTALS

A. Prior to Performing Any Work:

The following items shall be submitted to the Owner, two (2) weeks prior to performing any work. In addition to Section 1.02, G., 1., the following information shall be listed after the Table of Contents but prior to any of the manufacturer's information, etc.

1. Materials List:

   Complete materials list that shall include the manufacturer, model number, and description of all materials and equipment to be used and shall use the following format (double space between each item).

Item No.	Description	Manufacturer	Model
1. PVC Lateral Fittings	Spears	Schedule 40	
2. Turf spray heads	Rain Bird	1800 SAM/PRS Series	
3. Etc.	Etc.	Etc.	

2. Notarized Certificates:

   Notarized certificates for plastic pipe and fittings manufacturer indicating that material complies with the specifications unless material has been previously approved.

   The Contractor shall furnish the articles, equipment, materials or processes specified by name in the drawings and specifications. No substitution will be allowed without prior written approval by the Owner.

   a. The Contractor shall submit to the Landscape Architect catalog data and full descriptive literature for approval of all items specified.
   b. Submit shop drawings and specifications for controller enclosure assembly(s), including electrical wiring schematic(s). Submit shop drawings and specifications for all special assemblies, e.g. booster pump(s), fertilizer injection, controller enclosure, central control computer system, flow sensing equipment, etc., if shown on the drawings.
   c. Equipment or materials installed or furnished without the prior approval of the Landscape Architect may be rejected and the Contractor is required to remove such materials from the site at Contractor’s own expense.
   d. Approval of any item. Alternate or substitute, indicates only that the product(s) apparently meet the requirements of the drawings and specifications on the basis of the information or samples submitted.
   e. Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranty shall only supplement the guarantee.
   f. Material shall be of the best quality obtainable, of American manufacture, and shall comply strictly with the drawings and specifications. All equipment shall be new and unused prior to installation.

B. Prior to Substantial Completion: The following items shall be submitted to the Landscape Architect no later than ten (10) days prior to substantial completion of the installation of all improvements. Once approved by the Landscape Architect these items shall be forwarded to the Owner by the Landscape Architect with two (2) Landscape Architect’s wet stamped certification letters documenting that the work has been completed in substantial conformance with the approved plans and specifications for distribution.

   1. Two Controller Charts for Each Controller:

      a. Provide two (2) sets of controller charts for each controller unit installed on the project. The controller charts shall have a reduction of the area covered by that

controller unit and shall be at the maximum allowable scale that will fit inside the controller door without folding the drawing.

b. After final approval from the architect, each controller drawing shall be hermetically sealed between two (2) pieces of minimum 20 mils thick plastic. The Contractor will permanently fix one (1) controller drawing to the inside of each controller unit and bind one complete set of controller drawings in a loose leaf binder and submit to Owner or Owner's representative prior to scheduling a final walk through.

2. Two Operation and Maintenance Manuals:

Contractor is to prepare two (2), individually hardbound copies of operation and Maintenance manuals. The manuals shall describe the material installed. Each complete manual shall include the following information:

a. Index sheet stating Contractor's address and telephone number, list of equipment including names and addresses of local manufacturer representatives.
b. Complete operating and maintenance instruction for all equipment.
c. Spare parts lists, and related manufacturer information for all equipment.
d. A guarantee for the sprinkler irrigation system. This guarantee form shall be retyped onto the Contractor's letterhead.
e. Contractor's performance bond information, including bonding company, bond number, agent and phone number.
f. Listing of all required warranties and guarantees with effective dates and expiration date.
g. Current watering schedule requirements.

3. Equipment:

As part of the contract, the Contractor shall supply the following items:

a. Two (2) keys for controller, controller enclosure.
b. Two (2) sets of any special equipment required for operating, adjusting, assembling and removing each type of equipment supplied on the project and as requested by the Owner.
c. Two (2) sets of quick coupler keys, and swivel elbows per each point of connection.

4. Irrigation Guarantees, Certifications and Approvals:

a. Two (2) Irrigation Contractor's original of all guarantee letters.
b. Two (2) manufacturer/supplier installation certification irrigation controller approvals.

5. Annotated set of "As-Built" Record Drawings as specified herein.
6. Written Certification: Contractor shall provide a written certification that the irrigation and landscape systems are installed free from defects in materials and workmanship and in full compliance with the drawings and specifications. This shall be on Contractor's letterhead with its irrigation and California C-27 Contractor's license number.

1.4 PRODUCT HANDLING

A. Protection: Use all means necessary to protect irrigation system materials before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacements:
1. In the event of damage and all discrepancies or unsatisfactory work, immediately make all repairs and replacements necessary to the approval of the Owner and at no additional cost to the Owner.
2. Exercise care in handling, loading, unloading and storing PVC pipe and fittings. Store PVC pipe and fittings under cover until ready to install and return any portion of the unused PVC pipe back under cover after that day's work; transport PVC pipe only on a vehicle with a bed long enough to allow the pipe to lay flat to avoid undue bending and concentrated external load.
3. Repair all dented and damaged pipe by cutting out the dented or damaged section and rejoining with couplings.

C. Connections to Existing Main Lines:
1. Source of water supply: the Contractor shall verify and be familiar with the location, size and detail of stub-outs provided as the source of water supply to the sprinkler system, as shown on the plans. Source of supply and point of connection shall be as shown on plan.
2. Existing utilities and conditions: Prior to cutting into the soil, the Contractor shall locate all cables, conduits, sewers, septic tanks and other utilities as are commonly encountered underground and he shall take proper precautions not to damage or disturb such improvements. If a conflict exists between such obstacles and the proposed work, the Contractor will proceed in the same manner if rock layer or any other conditions encountered underground make changes advisable.
3. Where investigation of subsurface conditions have been made by a qualified body in areas in which local materials may be obtained, the Contractor may request the use of such information but will be directly responsible for its verification and accuracy.

D. Observation: The Contractor shall at all times permit the Owner and its authorized agents to visit and observe the work or any part thereof. The Contractor shall maintain proper facilities and provide safe access for such observations to all parts of the work. Where the specifications require work to be tested by the Contractor, it shall not be covered up until tested or approved by the Owner and the Contractor shall be solely responsible for notifying the proper governmental agencies where and when such work is in readiness for testing. Should any such work be covered without such test or approval, it shall, if so ordered, be uncovered at the Contractor's expense.

E. Standard of Installation: Material and workmanship shall be in accordance with local codes and ordinances of legally constituted authorities, except that where provisions of these specifications and details exceed such requirements.

F. General Requirements:
1. Code requirements shall be those of State and Municipal Codes and Regulations locally governing this work, providing that any requirements of the drawings and specifications, not conflicting therewith but exceeding the code requirements shall govern, unless written permission to the contrary is granted by the Landscape Architect.
2. Conform to the requirements of the reference information listed below except where more stringent requirements are shown or specified in the most current set of construction documents:

American Society for Testing Material (ASTM), for test methods specifically referenced in his section.
Underwriters Laboratories (UL), for UL wires and cables.

3. Work involving substantial plumbing for installation of copper piping, backflow prevention devices and other related work shall be executed by a licensed and bonded plumbing Contractor. Any necessary permits shall be obtained prior to beginning work.
4. Specified depths of pressure supply lines, laterals and pitch of pipes as stated in this section are minimums. Settlement of trenches lower than grades specified on the final grading plans is cause for removal of finish grade treatment, refilling trenches, re-compacting and repairing of finish grade treatment.
5. Pre-planting requirements: The Contractor shall have installed all the irrigation per each meter per the irrigation plans and specifications. Prior to planting any plant material the irrigation system has to be 100 percent operational per the irrigation plans and specifications.

G. Preservation and Cleaning: The Contractor shall clean up the work as it progresses. At frequent intervals, and at all times when directed by the Owner or Landscape Architect the Contractor shall remove and dispose of accumulations of rubbish and debris of all kinds. At the time of completion the entire site shall be cleaned of tools, equipment, rubbish, etc., all of which shall be removed from the site, and the entire project, including surrounding premises, shall be left in proper, clean condition ready for acceptance.

H. Completion: The work will be considered for acceptance in writing when the entire scope of work has been completed satisfactorily to the Owner and Landscape Architect. In judging the work, no allowance for deviation from the original plans and specifications will be made unless already approved at proper times by the irrigation designer. When any item appears on the
plans, and not in the specifications, or in the specifications and not on the plan, it shall be considered in both. The Owner shall have final authorization on all items of the project.

I. Loose Equipment to Furnish: Loose operating keys and spare parts shall be furnished to the Owner by the Contractor in quantities as specified herein.

J. Irrigation Guarantee:
1. The entire sprinkler system shall be unconditionally guaranteed by the Contractor as to material and workmanship, including settling of backfilled areas below grade for a period of one (1) year following the date of final acceptance of the work.
2. If, within one (1) year from the date of final acceptance of the work, settlement occurs and adjustments in pipes, valves and sprinkler heads, sod or paving is necessary to bring the system, sod or paving to the proper level of the permanent grades, the Contractor, as part of the work under his contract, shall make all adjustments without extra cost to the Owner, including the complete restoration of all damaged planting, paving or other improvements of any kind.

Should any operational difficulties in connection with the sprinkler system develop within the specified guarantee period which in the opinion of the Owner may be due to the inferior material or workmanship, said difficulties shall be immediately repaired at no additional cost to the Owner, including any and all other damage caused by such defects.

K. The Contractor shall secure the required licenses and permits including payments of charges and fees and give required notices to public authorities and verify permits secured or arrangements made by others affecting the work of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Materials or equipment installed or furnished shall be new. Any that do not meet the local governing agency (ices) standards shall be rejected and shall be removed from the site at no expense to the Owner.

B. Pipe:

All threaded pipe shall be threaded by the manufacturer of the pipe.

C. PVC Pipe and Fittings for Domestic Water System:

1. Solvent weld pressure supply lines two (2) inch – 2-1/2-inch downstream of the backflow preventor assembly on the Domestic water systems shall be White Class 315 PVC.
2. Pressure supply lines one (1) inch - 1-1/2-inch downstream of the basket strainer assembly on reclaimed water systems shall be Schedule 40 White PVC.
3. Plastic pipe shall bear the following marking: manufacturer’s name, nominal pipe size, schedule or class, type of material, pressure rating in psi, NSF seal of approval, and the date of extrusion.
4. All pressurized PVC solvent weld fitting shall be Spears Schedule 80.
5. Threaded nipples shall be standard weight Schedule 80 with molded threads.
6. Separate primer and solvent cement applications shall be required for all plastic pipe joints per manufacturer’s recommendations.
7. Each pressurized supply line from one (1) inch to 2-1/2-inch shall be installed within a separate trench only and each trench shall have a minimum width of one (1) foot.
8. There shall be four (4) inches of sand between both, the mainline and the remote control valve wiring and below the entire length the mainline.

D. PVC Non-Pressure Lateral Line Piping for Domestic Water System:

1. Non-pressure buried lateral line piping shall be White PVC Schedule 40 with solvent welded joints.
2. White PVC Schedule 40 BE pipe shall be made form NSF approved Type 1, Grade 1 PVC compound conforming to ASTM Resin Specification 1785. All pipe must meet requirement as set forth in Federal Specification PS-21-70 with an appropriate standard dimension ratio.
3. Except as noted in paragraphs 1 and 2, all requirements for non-pressure lateral line pipe and fittings shall be the same as for solvent-weld pressure mainline pipe and fittings as set forth in Section 2.01-B of these specifications.
4. All non-pressure lateral fittings shall be Schedule 40 PVC as manufactured by Spears.

E. Ultra-violet resistant plastic pipe (solvent weld). Pipe shall meet manufacturer’s tolerance specified, in addition to commercial standards. All pipe shall be NSF approved.

1. Specified lateral on slopes shall be a UVR-PVC on grade, Schedule 40, PVC pipe.
2. The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions or other defects.
3. Pipe shall be continuously and permanently marked with manufacturer's name, material designation UVR-PVC 1120, Schedule NSF and manufacturing code approval.

4. UVR plastic fittings shall be Schedule 40 PVC 1120, Type I, Grade I, manufactured by SUN-STOP or approved equal.

F. Brass Pipe and Fittings:

1. Where indicated on the drawings, use 85 percent red brass, ANSI, Schedule 40, screwed pipe conforming to Federal Specification #WW-P-351.
2. Fittings shall be medium brass, screwed 125-pound class, conforming to Federal specification #WW-P-460.

G. Copper Pipe and Fittings:

1. Pressure supply line (from point of connection through backflow prevention device): Type K copper hard tempered, in accordance with ASTM B4284.
2. Fittings: Wrought copper, solder joint type.
3. Joints: Solder shall be made up of 45 percent silver, 15 percent copper, 16 percent zinc and 24 percent cadmium and solids at 1125° Fahrenheit and liquefies at 1145° Fahrenheit.

H. Gasket-End Pressure Supply Line and Fittings:

1. Plastic pipe for use with rubber ring gaskets shall be rigid un-plasticized polyvinyl chloride PVC 1120 (Type 1, Grade 1), manufactured in accordance with ASTM D 2241. Plastic pipe marked with product standard PS 22-70 conforms to ASTM requirements. Pipe shall be supplied with rubber ring groove. Couplings for plain end pipe shall be of the single rubber ring type with solvent weld socket on one end or shall be of the double ring type, manufactured by Apache.
2. Rubber ring gaskets shall be of a synthetic rubber supplied in accordance with the requirements of ASTM D 1869.
3. Pipe shall be furnished in the following Standard Dimension Rations (SDR) and Pressure Ratings: 1380 kPa (200 psi) SDR 21
4. Lay pipe and make pipe to fitting or pipe to pipe joints following OR70 recommendations (Johns-Manville Guide for Installation of Ring-Tite Pipe), or pipe manufacturer’s recommendations.
5. Pipe shall be snaked from side-to-side of trench bottom to allow for expansion and contractions.
6. All changes of direction over 15° shall be made with fittings.
7. For thrust blocking use and refer to Leemco joint restraint system. See manufacturer’s recommendations for installation.
8. When pipe laying is not in progress and at the end of each working day, close pipe ends with tight plug or cab.
9. Install pressure supply line locating tape along the entire length of pressure supply line to identify pressurized reclaimed irrigation mainline.
10. Center load pipe with small amount of backfill to prevent arching and slipping under pressure. Leave joints exposed for inspection during testing.
11. Coordinate pressure supply line with sand bedding operations.
12. No water shall be permitted in the pipe until inspections have been completed and a period of at least 24 hours has elapsed for solvent weld setting and curing to have occurred.
13. All fittings shall be deep bell, manufactured of ductile iron, Grade 65-45-12 in accordance with ASTM A-536. Reducers and plugs shall be made available with four (4) lugs to accommodate joint restraints in any orientation.

14. All gasketed end pressure supply line shall be installed within a separate trench only and each trench shall be a minimum width of one foot (1'), or shall be a minimum of three (3) times the diameter of the gasketed pipe whichever one is greater.
15. All bolts shall be stainless steel only.
16. There shall be four (4) inches of sand between both, the mainline and the remote control valve wiring and below the entire length the mainline.

2.2 ISOLATION VALVES

A. Isolation Valves: as specified on drawings.

B. Gate valves for one (1) inch – two (2) inch pipe Brass construction; solid wedge, ISC threads, non-rising stem with brass cross-top handle.

C. All isolation valves shall have a T. Christy's ID-MAX-P2-RC1P2 attached to each isolation valve stem. Each valve box lid shall have an Applied Engineering Product nameplate and shall be attached with stainless steel sheet metal screws.
The above specified valve shall be installed with a green lockable ten (10) inches round valve box as specified on drawings.

2.3 QUICK COUPLING VALVES

A. Quick coupling valves shall be brass or bronze with built-in flow control and self-closing valve and supplied in ¾-inch size unless otherwise specified. When a quick-coupler assembly is specified, it shall consist of the valve, quick coupler connection and hose swivel.

B. All quick coupler(s) shall have a T. Christy's ID-MAX-P2-RC1P2 attached to each quick coupler. Each valve box lid shall have an Applied Engineering Product nameplate and shall be attached with stainless steel sheet metal screws.

C. The above specified quick coupler(s) shall be installed with a green lockable ten (10) inches round valve box as specified on drawings.

2.4 WARNING TAPE FOR POTABLE WATER SYSTEMS

A. Warning tapes shall be used on all constant pressure main line piping carrying potable water. Blue labeled pipe permitted on potable water.

B. Warning tapes shall be a minimum of three (3) inches wide and shall run continuously for the entire length of all constant pressure mainline piping. The tape shall be attached to the top of the pipe with plastic tape banded around the tape and pipe every five (5) feet on-center.

C. Warning tape for constant pressure potable water piping shall be blue in color with the words "CAUTION BURIED WATER LINE BELOW" imprinted in minimum one (1) inch high letters black in color.

2.5 CONTROL WIRING

A. Control wires shall be direct burial, Type UF, 600 volt, AWG UF UL copper wire specified per the irrigation legend. Control wires shall be a different color for each automatic

controller. Common wires shall be white with a different color stripe for each automatic controller.

B. Connections shall be epoxy-sealed packet type connectors. Connectors shall be as specified on drawings.

C. Install three (3) spare control wires that shall be blue in color, and one (1) common wire spare wire to be white in color in a ten (10) inch round plastic lockable valve box.

D. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible. Minimum 24 inches below finish grade or six (6) inches below mainline whichever distance is greater.

E. Where one (l) wire or more is placed in a trench, the wiring shall be taped together with electrical tape with five (5) wraps around the RCV wires at intervals of ten (10) feet.

F. An expansion curl shall be provided within three (3) feet of each wire connection and at each change of direction of a wire run. Expansion curls shall be formed by wrapping at least five (5) turns of wire around a one (1) inch diameter pipe, then withdrawing the pipe.

G. When the control wiring or tubing is installed in a pipe trench, it shall be installed a minimum of 24 inches below finish grade. Continuous caution tape with suitable markings shall be installed in the trench six (6) inches above the wire or tubing.

H. When the electric valve remote control wires or hydraulic tubing is installed in a pipe trench, it shall be installed a minimum of 24” below finish grade. Contractor shall install a four (4) inch wide continuous caution tape with suitable markings six (6) inches above the remote control wires or hydraulic tubing.

I. Control wiring or hydraulic control tubing shall be housed in conduit between the controller and a concrete pull box installed at least two (2) feet outside the limits of the controller foundation, or the structure foundation where the controller is housed.

2.6 AUTOMATIC CONTROLLER

A. Automatic Controllers shall be as specified on drawings and consist of a 120 volt single-phase, electric clock unit and shall be capable of being operated manually.

B. The automatic controller shall have the minimum number of stations as indicated on the drawings and shall feature automatic, semi-automatic or manual operation.

C. Each station shall have variable timing from two to 60 minutes and shall be equipped with on-off position to eliminate operation from any of the watering schedules.

D. All controllers shall be pedestal mounted type in a heavy duty stainless steel, weather tight, lockable enclosure with stainless steel piano hinges per the irrigation legend.

E. Each station shall have a repeat switch allowing selected schedules to be repeated after completion of the initial watering schedule.

F. All controller components shall be fused and have a chassis ground.

G. All controllers shall be equipped with a four (4) x four (4) inch electrical junction box. With an on/off G.F.I. switch and a grounded duplex receptacle mounted inside the enclosure.

2.7 ELECTRIC REMOTE CONTROL VALVES

A. Electric remote control valve shall be as specified on drawings.

B. The valve must have an automatic mechanical self-cleaning internal control system and must be slow closing to ensure smooth and shock free operation.

C. The electric remote control valve shall be equipped with a corrosion proof solenoid constructed of stainless steel and molded in epoxy resin to form one integral unit which is suitable for 24 volt operation.

D. The electric remote control valve shall be internal diaphragm and disassembly guided by a stainless steel stem in all positions.

E. All electric remote control valves shall be equipped with a control stem capable of reducing a higher inlet flow to a constant lower flow regardless of supply fluctuations.

F. All electric remote control valves shall be serviceable from the top without removing the valve body from system.

G. All electrical remote control valves shall have the capability of manual operation.

H. If electric remote control valves are specified with a pressure regulator, the Contractor shall provide the type specified on the plans.

I. Contractor shall install one (1) T. Christy's I.D. tag to each valve type as follows: non-potable water conditions ID-MAX-P2-RC2P2 and for potable water conditions ID-MAX-B2-PW2B2 with an ID-MAX-G2-PW1G2 with the valve number.

2.8 VALVE BOX

A. Valve boxes shall be fabricated from a durable plastic material resistant to weather, sunlight and chemical action of soils. They shall be green in color. The cover shall be capable of sustaining a load of 1,500 psi. Valve box extensions shall be by the same manufacturer as the valve box. All valve boxes shall be as manufactured by Applied Engineering Products.

B. Install valve boxes with each type of irrigation equipment so that of valve box is above finish grade as specified on the detail drawings. Valve box extensions are not acceptable except for master valves, flow sensor and large gate valves.

C. Place gravel sump below and around each valve box prior to installing valve box as specified on the drawings. Place remaining portion of gravel inside valve box allowing full access in and around all fittings. Valve box shall be fully supported by gravel sump. No brick or wood supports are allowed except for the large basket strainer assembly and the master valve assembly that will need to be supported with concrete blocks.

D. Brand valve box lid of associated equipment as follows:

1. Electric control valve box lid with "Controller Letter and Station Number".
2. Quick coupling valve box lid with "Controller Letter" and the letters "QC".

3. Isolation gate valve box lid with “Controller Letter” and the letters “GV”.
4. Air relief valve box lid with “Controller Letter” and the letters “AR”.
5. Wire splice box lid with “Controller Letter” and the letters “WS”.
6. Manual drain valve box lid with “Controller Letter” and the letters “MDV”.

E. Letter and number size of brand shall be two (2) inches in height and shall be 1/8-inch maximum in depth. Provide sample branding to the Owner or Owner’s representative prior to commencement of work.

F. Walk though for establishment and/or substantial completion will not be allowed until all branding is complete.

G. All valve boxes shall be installed within shrub planting areas only.

2.9 SPRINKLER HEADS

A. All sprinkler heads shall be of the same size, type and deliver the same rate of precipitation with the diameter (or radius) of the throw, pressure and discharge as shown on the plans and/or specified in these special provisions.

B. Equipment of one type and flow characteristic shall be from the same manufacturer and all equipment shall bear the manufacturer's name and identification code in a position where they can be identified in the installed position. Rotary heads shall be impact-type drive rotary,
pop-up type and designed with an integral check valve for control of line drainage. The sprinkler shall be capable of delivering radius and gallonage indicated on drawings. Retraction shall be accomplished by means of a heavy duty stainless steel spring. The sprinkler shall have a riser seal and wiper,

C. Pop-up spray heads shall be constructed of impact-resistant Cycolac material. Heads shall be retracted by means of a stainless steel retraction spring and shall have a combination piston/wiper seal. All heads shall be a minimum six (6) inch pop-up.

D. Pop-up sprinklers shall rise at least to minimum operative height per manufacturer’s specifications during operation.

E. Full or part circle sprinklers shall be interchangeable in the same housing.

F. Shrubbery and bubbler heads shall be adjustable from full flow to shut-off.

G. Sprinkler heads for small turf, small shrub, and ground cover areas shall be as specified in the irrigation legend. All nozzles shall be per the irrigation legend.

H. Sprinkler heads for large turf and ground cover areas shall be gear driven rotary type pop-up. The body shall be constructed with ¾-inch or one (1) inch N.P.T. bottom inlet. Sprinkler nozzle shall pop up a minimum of 2-1/2-inches with positive spring retraction. Sprinkler heads shall be as shown on the plans or approved equal.

I. Stream spray pop-up rotor type sprinkler heads shall be as shown on the plans or approved equal and may be acceptable in Association maintained areas only. In turf areas sprinkler heads shall have a protective rubber cover. Pop height shall be determined per the irrigation legend.

J. Angled nipples on swing joints below spray heads and rotors shall not exceed 45° nor be less than 10°.

K. After installation adjust nozzle sizes, arcs and radius of throw to allow head to head uniform distribution. Adjust all spray head and rotors to correct height above sod as detailed. No over spray will be allowed on paving, hardscape, sidewalks and paths.

L. Adjust adjacent plant material so that it does not interfere with uniform distribution of each spray head or rotor.

M. Landscape Architect may request nozzle changes and/or adjustments without additional cost to the Owner.

N. All spray heads and rotor heads shall be installed per the details.

2.10 ELECTRICAL HIGH VOLTAGE

A. All electrical equipment shall be NEMA Type 3, waterproofed for exterior installations.

B. All high voltage electrical work shall require separate electrical permit and inspection.

2.11 EQUIPMENT ENCLOSURES

A. All equipment enclosures for pumps and controllers shall be vandal-resistant, stainless steel, have stainless steel piano hinges and be UL listed. Stainless steel enclosures shall be “The Strong Box” and shall not be painted.

B. Automatic controller enclosures shall be louvered vents covered by a brass or stainless steel mounted inside the enclosure.

2.12 CONDUIT

A. Conduit and conduit fittings shall be galvanized by the hot-dip, electrode positing, or metallizing process in accordance with subsection 210-3 of the Standard Specifications for Public Works Construction 1988 Edition. Galvanized conduit shall conform to standards for rigid steel conduit as specified by Underwriters Laboratories, Inc., and shall bear the underwriter’s label on each length.

B. Conduit shall be of the size indicated on the plans. It shall be the option of the Contractor to use larger conduit than that specified, provided that where such substitution is made, it shall be for the length of the conduit run. No reducing fittings will be permitted.

C. The ends of the conduit shall be free of burrs and rough edges.

D. The maximum bend of a conduit shall be 90° and the minimum radius of a bend shall be not less than six (6) times the inside diameter of the conduit.

E. All threads shall be treated with approved joint compound before fittings are placed thereon. Where the galvanized coating of conduit or fittings has been injured in handling or installing, such damaged areas shall be thoroughly painted with a rust preventative paint.

F. Ends of conduit shall be properly coupled. Running threads, thread-less connectors or threadless couplings will not be permitted.

2.13 CONDUCTORS

A. Line voltage conductors shall be supplied in the sizes and types shown on the plans and shall be THW or THWN, 600-volt insulation rating, conforming to the applicable provisions of ASTM D 2219 and D 2220.

B. Control System Interconnect Conductors
1. All irrigation interconnect conductors shall be pulled by hand.
2. A total of two feet of slack shall be left at each field satellite unit and within each pull box. Sufficient slack shall be left to allow the wire to extend 18 inches above the top of the pull box grade.
3. Small, permanent, identification bands shall be marked "irrigation interconnect" or as specified and securely attached to irrigation interconnect wires in each pull box near the termination of each wire. Permanent identification bands shall be embossed 6-mil oil-resistant PVC tape with pressure sensitive backing.

2.14 PULL BOXES

A. Pull boxes shall be installed at intervals not to exceed 200 feet and at each location where the installation of the conduit is to be phased, and at each point where the conduit crosses a roadway, bridge, or major utility easement.

B. Pull boxes shall be installed in shrub planted areas only.

C. The bottom of box shall be bedded in pea gravel six (6) inches deep and one-half inch of grout prior to installation of the irrigation interconnect. A layer of 15# roofing paper shall be placed between the grout and the pea gravel. A one-inch diameter drain hole shall be provided through the center of the pull box grout and roofing paper.

2.15 OTHER MATERIALS

A. All other materials, not specifically described but required for a complete and proper irrigation system installation, shall be new, first quality of their respective kinds and subject to the approval of the Owner & Landscape Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection: Prior to all work of this section, carefully inspect the original design, the referenced standard and the manufacturer’s recommendations. System to be installed in accordance with all pertinent local governing agency (ices) codes and regulations, the original design and the referenced standards.

B. Discrepancies
1. In the event of discrepancy, immediately notify the Owner.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved to the satisfaction of the Owner.

3.2 FIELD MEASUREMENTS

A. Make all necessary measurements in the field to ensure precise fit of items in accordance with the original design.

3.3 TRENCHING AND BACKFILLING

A. Trenching:
1. Refer to drawings for depth of trenching.
2. Pulling in of pipe and control wires shall not be permitted.
3. Mechanical trenching machines shall be of an approved type to cut trenches with straight sides. Pipes shall be supported continuously on the bottom of the trench and shall be laid to an even grade. Trenching excavation shall follow layout indicated on drawings to the depths below finish grade as noted.
4. Where it is necessary to excavate adjacent to existing trees, the Contractor shall avoid injury to trees and tree roots. Excavation in areas where two (2) inches, and larger roots occur shall be heavily wrapped with wet burlap. Trenches within the drip line of trees shall be closed within 24 hours.
5. All pressurized mainline shall be installed in a 12 inch wide trench minimum. Each mainline shall be installed in a separate trench, as described in previous sections of the irrigation specifications.

B. Backfilling:
1. Backfill material shall be per the irrigation details. Unsuitable material, including clods and rocks over ½-inches in size, shall be removed from the premises and disposed of legally at no cost to the Owner.
2. Trenches and excavations shall be backfilled so that the specified thickness of topsoil is restored to the upper part of the trench. Backfill shall be flooded in accordance with subsection 306-1.3.3 of the Standard Specifications of Public Works Construction, 1988 Edition.
3. Depth of trenches shall be sufficient to provide a minimum cover above the top of the pipe per details.
4. Refer to drawings for depth of trench and backfill.
5. Where it is necessary to excavate adjacent to existing trees, the Contractor shall avoid injury to trees and roots. Excavation in areas where two (2) inch and larger roots occur shall be done by hand. All roots two (2) inches and larger in diameter shall be tunneled under and shall be heavily wrapped with burlap, to prevent scarring or excessive drying. Where a ditching machine is run close to trees having roots smaller than two (2) inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts through roots. Roots one (1) inch and larger in diameter shall be painted with two (2) coast of Tree Seal, or equal. Trenches adjacent to trees should be closed within 24 hours; and where this is not possible, the side of the trench adjacent to the tree shall be kept shaded with burlap or canvas.
6. All mainline, lateral and RCV wires shall have a minimum clearance of 12 inches from each other and 12 inches from lines of other trades.
7. Parallel lines shall not be installed directly over one another.
8. Surplus earth remaining after backfilling shall be disposed of on the premises as directed by the Owner.
9. For minimum clearance to domestic lines per Health Code please review local governing agency (ices) notes.

3.4 INSTALLATION OF PIPING

A. General:

1. Lay out the piping system in strict accordance with the drawings and to the depth as specified in Section 3.03.
2. Unless otherwise provided, irrigation system layout shown on the plans shall be considered schematic. With the Owner's approval, the Contractor may make adjustments where necessary to conform to actual field conditions. The irrigation system shall be operational, with uniform and adequate coverage of the areas to be irrigated prior to planting.

B. Under Existing Pavement:
1. Piping under existing pavement may be installed by jacking, boring or hydraulic driving except that no hydraulic driving will be permitted under asphaltic concrete pavement, or at depth less than 36 inches.
2. Where cutting or breaking of existing pavement is necessary secure permission from local governing agency (ices) before cutting or breaking the pavement. Contractor shall make and be financially responsible for all necessary repairs as required by local governing agency (ices) or Owner at no additional cost to the local governing agency (ices) or Owner.

C. Inspection of Pipe and Fittings: Carefully inspect all pipe and fittings before installation, removing all dirt, scale, burrs and reaming as required; install all pipe with all markings up for visual inspection and verification.

D. Gasket-End Pressure Supply Line and Fittings:

1. Gasket-End Pressure Supply Line: (downstream of basket strainer device) Reclaimed PVC Class 200RT (three (3) inches, and larger).
2. Manufactured from virgin polyvinyl chloride (PVC) compound in accordance with ASTM D2241 and ASTM D1784; cell classification 12454-B
3. Type 1, Grade 1
4. All fittings shall be Leemco deep bell, manufactured of ductile iron, Grade 65-45-12 in accordance with ASTM A-536. Reducers and plugs shall be made available with four lugs to accommodate joint restraints in any orientation. Fittings shall be manufactured by Leemco, Inc., Corona, CA.
5. Gaskets: factory installed in pipe and fittings, having a metal or plastic support within the gasket or a plastic retainer ring for gasket.
6. Lubricant: as recommended by manufacturer of pipe fittings.
7. Leemco joint restraint system shall be used per manufacturer's recommendations for any PVC Class 200RT (three (3) inches, and larger).

E. PVC Pipe:
1. PVC pipe shall be installed in a manner which will provide for expansion and contraction as recommended by the pipe manufacturer. When requested by the Owner, the Contractor shall furnish the manufacturer's printed installation instructions before pipe installation.
2. In jointing, use only the specified solvent and make all joints in strict accordance with the manufacturer's recommended methods, give solvent welds at least 15 minutes setup time before moving or handling and 24 hours curing time before filling with water.
3. For plastic-to-metal connections, work the metal connections first, use a non-hardening pipe dope on all threaded plastic-to-metal connections and use only light wrench pressure. All plastic-to-metal connections shall be made with plastic male adapters. All non-hardening pipe dope to be used per PVC fittings manufacturer's recommendations.

4. During installation of pipe, fittings, valves, and other pipeline components, foreign matter shall be prevented from entering the system. All open ends shall be temporarily capped or plugged during cessation of installation operations.
5. Changes in pipeline size shall be accomplished with reducer fittings.
6. Plastic pipe shall be jointed by socket type solvent welded fittings, threaded fittings, rubber ring fittings or by other means specified. When plastic pipe is joined to steel pipe, the steel pipe shall be installed first.
7. Plastic pipe shall be cut square, externally chamfered approximately 10-15°, and all burrs and fins removed.
8. Solvent welded joints shall be made in accordance with ASTM D 2855. The solvent recommended by the manufacturer shall be used.
9. Plastic pipe installation shall be in accordance with ASTM D 2774 and the requirements herein.
10. Care shall be exercised in assembling a pipeline with solvent welded joints so that stress on previously made joints is avoided. Handling of the pipe following jointing, such as lowering the assembled pipeline into the trench, shall not occur prior to the set times specified in ASTM D 2855.
11. Solvent shall be applied to pipe ends in such a manner that no material is deposited on the interior surface of the pipe or extruded into the interior of the pipe during jointing. Excess cement on the exterior of the joint shall be wiped clean immediately after assembly.
12. Threads for plastic pipe shall be as specified in Subsection 308-5.2.2. A plug shall be installed in the bore of the pipe to prevent distortion prior to threading.
13. Threaded pipe joints shall be made using Teflon tape or other approved jointing material. Solvent shall not be used with threaded joints.
14. Pipe shall be protected from tool damage during assembly. Vises shall have pleated jaws and strap wrenches shall be used for installations of fittings and nipples.
15. Plastic pipe which has been nicked, scarred or otherwise damaged shall be removed and replaced. Plastic pipe shall be snaked from side to side in the trench to allow one (1) foot of expansion and contraction per 100 feet of straight run.
16. The pipeline shall not be exposed to water for 24 hours after the last solvent welded joint is made.
17. Centerload all plastic pipe prior to pressure testing to resist displacement.
18. All threaded PVC to PVC connections shall be assembled using Permatex #51 pipe joint compound, a non-hardening sealant or approved equal.
19. Threaded PVC female fittings shall not be used with brass or copper pipe. Use a non-hardening pipe dope on all threaded plastic-to-metal connections, except where noted otherwise.

3.5 INSTALLATION OF EQUIPMENT

A. Automatic Controller Location and Installation
1. Automatic controller shall be installed outside of the coverage pattern of the irrigation system at location shown on the plans. The control components in the controller shall be fused and the chassis shall be grounded.
2. The controller location is essentially diagrammatic, and shall be specifically located and approved by the Owner.
3. All local and applicable codes shall take precedence in the furnishing and/or connecting of 120 volt electrical service to the controller.
4. All service wiring shall be installed at the minimum depth specified in Subsection 308-2.8 shall govern the locations of service points. A separate disconnect switch or combination meter socket, as required, shall be installed between the source of power and the controller. The minimum service wire shall be No. 12 AWG copper 600 volt type TW, THW or THWN or larger as required by the Specification or controller

manufacturer. Wire splices shall be located only in specified pull boxes and shall be made with a packaged kit approved for underground use, or as specified in Subsection 307-2.5. Pull boxes shall be concrete, set to grade on a 12inch layer or 3/8-inch KRC Rock Birdseye pea gravel.

5. Controller shall be located behind shrubs and/or adjacent to hardscape with an 18 inch planting space between the face of the concrete assembly base and for back of turf mow curb or other hardscape areas. Overspray onto controller shall not be accepted. Maintenance access shall be provided.
6. The location of the controller shall be as shown on the drawings and shall be approved by the Owner before installation. The electrical service shall be coordinated with this location.
7. Local government agency (ices) maintained controllers shall have the irrigation interconnect terminating inside the controller enclosure. All conduits and wiring shall enter the enclosure from the bottom.

B. Control Wiring:
1. Control wires shall be installed in accordance with valve manufacturer's specifications and wire chart.
2. Control wiring located beneath paved areas shall be installed in a separate schedule 40 PVC sleeve.
3. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible lay below the mainline. Control wires shall be laid loosely in trench without stress or stretching to allow for contraction of wires. Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten (10) feet. An expansion curl shall be provided within three (3) feet of each wire connection. Expansion curl shall be of sufficient length at each splice connection at each electric control valve, so that in case of repair, the valve bonnet maybe brought to the surface without disconnecting the control wires.
4. An expansion curl shall be provided every 100 feet on runs of more than 100 feet in length. Provide looped slack at valves and changes in direction of 90°.
5. Field splices between the automatic controller and electrical control valves shall not be allowed without prior approval of the Owner. Splices in control wire shall be made in accordance with the requirements of service wire. Splices shall be vaulted and noted on as-built drawings. An expansion curl of two (2) feet shall be provided at each field splice and point of connection in pull boxes and valve boxes.

C. Electrical Work: All electrical work shall be installed per code requirements.

D. Quick Coupling Valves: Quick coupling valves shall be set approximately 12 inches from walks, curbs, header boards or paved areas where applicable Vertical positioning of quick coupling valves shall be such that sleeve top will be four (4) inches above settled finish grade in ground cover areas and at grade in turf areas. Quick coupler valve boxes shall be located 12 inch from paved surfaces.

E. Valves and Valve Boxes:
1. All valves shall be installed as shown in details and in accordance with manufacturer's recommendations.
2. All valves shall be the full size of the line in which they are installed unless otherwise indicated.
3. All valves shall be set at sufficient depth to provide clearance between the cover and the cap, valve handle, or key with the valve is in the fully open position.
4. Valves and valve boxes shall be installed as shown on the drawings and details. The top of valve boxes shall be one (1) inch above finish grade in ground cover and shrub

areas. Install each remote control valve and quick coupling valve in a separate valve box and allow at least 12 inches between valve boxes.

5. Place four (4) cubic feet of pea gravel prior to installation of any valve box 12 inches in length, and smaller. Any valve box larger than 12 inches in length shall receive 12 cubic feet of pea gravel.

F. Closing of Trenches and Flushing of Pipes:

1. Main Lines

a. Mains shall be flushed before installing remote control valves, quick-coupler valves, hose bibbs or pressure-relief valves and with pipe center-loaded. All water being discharged shall be temporarily piped up and out of the trenches. Trenches are to be kept dry for pressure tests to follow. Install all valves after approval of flushing procedure by the Owner's representative. Contractor shall notify Owner and submit in writing a description of the proposed flushing operation five (5) working days prior to flushing operation commencing.

2. Lateral Lines

a. Prior to installation of sprinkler heads and after all new lateral lines and risers are connected, the valves shall be opened and a full head of water used to flush out the lines and risers. Flushing shall be performed in the presence of the Owner's representative until flow is clean and free of all foreign material. Contractor shall notify Owner and submit in writing a description of the proposed flushing operation five (5) working days prior to flushing operation commencing.

3.6 TESTING AND INSPECTION

A. General:
1. Furnish all necessary testing equipment and personnel.
2. Correct all leaks and retest until accepted by the Owner.
3. Contractor shall notify Owner's representative and deliver required submittal items at least 48 hours in advance of the time of installation is required.
4. Contractor shall review, and make the necessary coordination calls to the landscape architect per the site observation schedule on the irrigation legend and notes.
5. Contractor shall coordinate a pre-installation meeting with the controller assembly manufacturer and the Landscape Architect to discuss project constraints, goals and manufacturer's required schedule of site certification milestones. This is to certify that each controller assembly meets the manufacturer's requirements as well as the Technical Specifications and Irrigation Plans.

B. Closing in Uninspected Work: Do not allow or cause any of the work of this section to be covered up or enclosed until it has been inspected, tested and approved by the Owner or local governing agency(ices).

C. Flushing: Before backfilling the mainline and with all control valves in place but before lateral pipes are connected, completely flush and test the drain line and repair all leaks, flush out each section of lateral pipe before sprinkler heads are attached. Contractor shall notify Owner and submit in writing a description of the proposed flushing operation five (5) working days prior to flushing operation commencing.

D. Testing:
1. Make all necessary provisions for thoroughly bleeding the line of air and debris.

2. Before testing, fill the line with water for a period of at least 24 hours.
3. Irrigation mainlines shall be center-loaded prior to conducting hydrostatic pressure test.
4. All hydrostatic tests shall be made in the presence of the Owner. No pressure line shall be backfilled until it has been inspected, tested, and approved in writing.
5. All gate valves along mainline shall be fully open for testing.
6. Testing of pressure mainlines shall occur prior to installation of remote control valves.
7. All pressure lines shall be tested under a hydrostatic pressure of 150 psi for a period of not less than four (4) hours. If leaks develop, joints shall be replaced, and test repeated until entire system is proven watertight.

E. Adjustment of the System:
1. The Contractor shall adjust all irrigation components for optimum performance, and to prevent overspray onto walks, roadways, buildings, and equipment as much as possible.
2. If it is determined that adjustments in the irrigation equipment will provide more uniform performance the Contractor shall make such adjustments prior to planting. Adjustments may also include changes in nozzle sizes and degrees of arc as required.
3. Lowering raised sprinkler heads and valve boxes by the Contractor shall be accomplished within ten (10) days after notification by Owner.
4. All sprinkler heads and valve boxes shall be set perpendicular to finished grades unless otherwise designated on the plans.

F. Coverage Test:
1. When the sprinkler irrigation system is completed and prior to any planting a coverage test shall be performed in the presence of the Owner’s representative to determine if the water coverage for planting areas is complete and adequate. If coverage is inadequate, corrections shall be made and another coverage test performed. Prior to the cover test to commence the irrigation system shall be operated by “radio remotes”.
2. Contractor, at the time of the irrigation coverage, shall perform a pressure test at the last head for each irrigation RCV. The Contractor shall perform the test in the presence of the Owner’s representative. Prior to performing this test the Contractor shall adjust each valve to reflect the pressures set for each type of spray, bubbler, and rotor head in the irrigation legend.
3. The entire sprinkler irrigation system shall be under full automatic operation for a period of seven (7) days prior to any planting.

END OF SECTION

SECTION 32 90 00 – PLANTING

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Contractor to furnish all labor, material, equipment, and services required to install all landscape planting, as indicated on the approved drawings and as specified herein, and shall perform all other incidental work necessary to carry out the intent of this specification and drawings including the following:

1. Fine grading, soil preparation, planting of trees, shrubs, vines, ground covers and lawn, guying and staking trees, and weed abatement.
2. 90-day Establishment/90-day Maintenance Period.
3. Provide guarantee per Landscape Sheet Notes.

B. All irrigation work shall be approved by the Owner or Landscape Architect prior to any work in this section being performed.

C. The Owner requires that a copy of the supplier's invoice be submitted along with the Contractor's progress payment request.

D. The above provisions do not alleviate Contractor from the cost responsibility for, but not limited to the following: (i) coordination, (ii) delivery, (iii) special handling, (iv) off loading, (v) storage, (vi) protection, and (vii) Maintenance; nor do the above provisions alleviate Contractor from all warranty responsibility of the trees as set forth in the Contract documents; nor do the above provisions alleviate Contractor from any other requirements or terms, or conditions set forth in the Contract documents.

1.2 ARGONOMIC SOILS REPORT

A. After completion of rough grading and prior to soil preparation, the Contractor shall at Contractor's own cost provide the testing of planting soils by an independent agronomic soils testing laboratory, (member of the California Association of Agricultural Labs) approved by Owner. Representative soil samples shall be taken in the field and a written report shall be prepared by the agronomist and shall include recommendations for soil amendments and application rates for soil preparation pre-plant fertilization, planting backfill mix, hydromulch slurry, any auger hole requirements, and post-Maintenance fertilization program.

B. Test results and recommendations shall be approved by the Owner prior to soil preparation to concur with recommendations shown herein.

C. Soil tests shall be performed after soil preparation to confirm that soil preparation was performed in compliance with pre-plant soils report and specifications.

1.3 SUBSTITUTIONS

A. Specific reference to manufacturers' names and products specified in this section are used as standards; this implies no right to substitute other materials or methods without written approval from the Owner.

B. Installation and warranty of any approved substitution shall be contractor's responsibility. Any changes required for installation or any approved substitution must be made to the satisfaction of the Owner without additional cost to the Owner. Approval by the Owner of substituted equipment and/or dimension drawings does not waive these requirements.

1.4 SUBMITTALS

A. Prior to installation, the Contractor shall submit to the Owner and Landscape Architect two (2) copies of manufacturers' literature, receipts of sale, and laboratory analytical data for the following items:

1. Organic Amendments
2. Topsoil
3. Commercial Fertilizer
4. Mulch
5. Erosion Control Fabric
6. Plant Material
7. Hydroseeding Work Sheets

B. Prior to hydroseeding, the Contractor shall submit to the Landscape Architect a six (6) ounce sample of the certified seed mix and bill of lading for materials.

C. Refer to irrigation specifications for additional submittal requirements.

1.5 PRODUCT HANDLING

A. Contractor shall furnish standard products in manufacturer's standard containers bearing original labels showing quantity, analysis, and name of manufacturer. All containers, bags, etc., shall remain on site until work is completed.

B. Contractor shall notify Landscape Architect seven (7) days prior to delivery of plant material and submit itemization of plants in each delivery.

1.6 CLEAN-UP

A. Upon completion of each phase of work under this section, the Contractor shall clean up and remove from the area all unused materials and debris resulting from the performance of the work. The site shall be left in a broom-clean conditions, and wash down all paved areas within the project site. Leave walks in a clean and safe condition.

PART 2 - PRODUCTS

2.1 PLANT MATERIALS

A. All plants shall be of the size, variety, age and condition as shown on the drawings and as specified here.

B. Quality - Plants shall be in accordance with the California State Department of Agriculture's regulation for nursery inspections, rules, and grading. All plants shall have a normal habit of growth and shall be sound, healthy, vigorous, and free of insect infestations, plant diseases, sun scales, fresh abrasions of the bark, or other objectionable disfigurements. Tree trunks shall be sturdy and well 'hardened' off. All plants shall have normally well-developed branch structure, and vigorous and fibrous root systems which are not root or pot bound. In the event of disagreement as to condition of root system, the root condition of the plants furnished by the Contractor in containers will be determined by removal or earth from the roots of not less than two (2) plants of each species or variety. Where container grown plants are from several sources, the roots of not less than two (2) plants of each species or variety from each source will be inspected. In case the sample plants inspected are found to be defective, the Landscape Architect reserves the right to reject the entire lot or lots of plants represented by the defective samples.

C. Plants shall be measured when branches are in their normal upright position. Height and spread dimensions specified refer to main body of plant and not branch tip to tip. Caliper measurement shall be taken at a point on the trunk three (3) feet above natural ground line. If a range of size is given, no plant shall be less than the minimum size and not less than 40 percent of the plants shall be as large as the maximum size specified. The measurements specified are the minimum size acceptable and are the measurements after pruning, where pruning is required. Plants that meet the measurements specified, but do not possess a normal balance between height and spread, shall be rejected.

D. Plants shall be nursery grown in accordance with good horticultural practices under climatic conditions similar to those of project for at least two (2) years unless otherwise specifically authorized by the Landscape Architect. All plants shall be heavy, symmetrical, tightly knit, so trained or favored in development and appearance as to be in form, number of branches, compactness and symmetry.

E. All plants shall meet the specifications of federal, state, and county laws requiring inspection for plant diseases and insect control. All inspection certificates required by law shall accompany each shipment, invoice, or order for stock; and when such plants arrive at the site, the certificates shall be delivered to the Landscape Architect.

F. Plants shall be true to species and variety in accordance with the American Association of Nurserymen Standards. Each group of plant materials delivered to the site shall be clearly labeled as to species and variety and nursery source.

G. Plants shall not be pruned before delivery. Trees which have damaged or crooked leaders, or multiple leaders, unless specified, will be rejected. Trees with abrasions of the bark, sun scalds, disfiguring knots, or fresh cuts of limbs over ¾- inch which have not completely callused will be rejected.

H. Plants not conforming to the requirements herein specified will be considered defective and such plants, whether in place or not, will be marked as rejected. Contractor shall immediately remove rejected plans from the premises and replace with new acceptable plants at his expense.

I. There shall be no substitutions of plants or sizes for those listed on the accompanying plans except with the approval of the Landscape Architect.

J. Container stock shall have grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Samples shall show no root-bound conditions.

Container plants that have cracked or broken balls of earth when taken from container will be rejected by the Landscape Architect.

2.2 TOPSOIL

A. Soil to be used as planting medium for the project shall be fertile, well-drained, or uniform quality, free of stones or one (1) inch in diameter, sticks, oils, chemicals, plaster, concrete, and other deleterious materials.

B. Imported topsoil shall be from sources approved by the Landscape Architect which meet the standards specified above.

C. The Contractor shall provide for the testing of proposed topsoil by a certified agronomic soils testing laboratory and shall submit soils analysis, recommendations and topsoil sample to the Landscape Architect for approval. Import topsoil shall not be delivered to the site prior to Landscape Architect's approval. The Landscape Architect may request additional testing of imported topsoil at the site to determine conformance to the approved report. Rejected topsoil shall be removed at no cost to the Owner.

D. If stockpiling is requested, locations and amounts of stockpile shall be approved by the Owner.

2.3 SOIL AMENDMENTS AND FETILIZERS

A. Provide standard, approved and first-grade quality materials, in prime condition when installed and accepted. Deliver commercially processed and packaged material and manufacturer's guaranteed analysis. Supply a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance, or bearing the manufacturer's guaranteed analysis to the Landscape Architect.

B. Organic Amendments: Organic amendments shall be derived from redwood or fir, be granular in nature, stabilized with nitrogen, and having the following properties:

1. Organic content - minimum 90 percent by weight.
2. Nitrogen content - 0.5 percent based on dry weight for redwood sawdust, 0.7 percent based on dry weight for fir sawdust, 1.0 percent based on dry weight for fir bark. Note: Pine sawdust is not acceptable.
3. Particle size - 95 to 100 percent passing 2.33 mm standard sieve.
4. Salinity - Ensure that saturation extract conductivity does not exceed 3.5 millimhos per centimeter at 25° C. as determined by saturation extract method.
5. Iron content - Minimum 0.08 percent dilute acid soluble Fe on dry weight basis.
6. Ash - Zero to six percent (0-6%) (dry weight).

C. Soil Amendments:

1. Soil sulfur - Agricultural grade sulfur containing minimum of 99 percent sulfur (expressed as elemental).
2. Iron sulfate - 20 percent iron (expressed at metallic iron), derived from ferric and ferrous sulfate, ten (10) percent sulfur (expressed as elemental).
3. Calcium carbonate - 95 percent lime as derived from oyster shells.
4. Gypsum - Agricultural grade product containing 90 percent minimum calcium sulfate.

5. Dolomite lime-Agricultural grade mineral soil conditioner containing 35 percent minimum magnesium carbonate and 49 percent minimum calcium carbonate, 100 passing No. 65 sieve; provide Kaiser Colomite 65 AG or other approved.
6. Fine sand - Clean, natural fine sand free from deleterious material, weed seed, clay balls, or rock with minimum of 95 percent passing a No. 4 sieve and maximum of ten (10) percent passing a No. 100 Sieve.

D. Fertilizer:

1. Fertilizer shall be pellet or granular form consisting of the percentage by weight of nitrogen, phosphoric acid and potash as recommended by the approved agronomic report. Planting fertilizer shall be mixed by the commercial fertilizer supplier.

   Plant tablets shall be slow release type with potential acidity of not more than five (5) percent by weight.

2.4 PESTICIDES AND HERBICIDES

A. All chemicals used for weed control shall be registered by the State of California Department of Food and Agriculture and the Environmental Protection Agency with registration identification on the label. Label shall be at job site at all times.

B. All chemicals shall be applied as per registered label instruction and manufacturer's recommendations.

C. Chemicals requiring a licensed applicator must be applied by persons registered with the County of Los Angeles Department of Agriculture's Commissioner's Office as possessing a current, valid, qualified pest control applicator's license.

D. The use of any restricted materials is forbidden unless a special use permit is obtained from the County of Los Angeles Department of Agriculture.

2.5 TURF

A. Turf Type: Turf shall be as shown on the drawings.

2.6 STAKING MATERIALS

A. Tree stakes shall be straight grained lodge pole pine free of knots, splits, checks, or disfigurements. Stakes shall be as specified in Planting Details. Stakes shall have a tapered driving point and chamfered top and shall be treated with copper napthanate or pentachloraphenol to heartwood.

B. Supports for double staking shall be twist braces as manufactured by V.I.T. Company, Inc., Huntington Beach, or approved equal.

C. Stakes shall be placed at right angle to prevailing wind or as directed by Landscape Architect.

2.7 GUYING MATERIALS

A. Guy wire shall be zinc coated iron, 10-gauge minimum and solid core.

B. Turnbuckles shall be galvanized or dip-painted and weldless.

C. Cable clamps shall be galvanized or copper, size as required.

D. Plastic guy covers shall be brown line PVC ½-inch diameter and shall be six (6) feet in length or provide 90 percent cover of guy wire.

E. Guying collar shall be ½-inch diameter new three (3) ply green garden hose (reinforced rubber). The collar shall completely cover the wire and loop around tree limbs. It shall be long enough to permit tree movement within the loop.

F. Deadmen shall be Steel Rapid Anchors as manufactured by V.I.T. Company, Inc. or approved equal. Size of anchor shall be per manufacturer's recommendations.

2.8 ROOT CONTROL BARRIERS

A. Root control barriers shall be provided as indicated on the plans, as required in the local governing agency (ices) tree planting guideline, and as specified herein.

B. Barriers shall be constructed of injection molded 50 percent post consumer polypropylene with UV inhibitors as manufactured by Deep Root Corp., or approved equal.

C. Barrier depth per drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform actual planting only during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice.

B. Confirm location and depth of underground utilities and obstructions. If underground structures or utility lines are encountered in the excavation of planting areas, other locations for planting shall be approved by the Landscape Architect.

C. All planting layout and staking shall be accurately made in accordance with the plans. All trees shall be a minimum of three (3) feet from local government agency (ices) Maintenance limit line.

D. Plant locations shall be approved by the Landscape Architect prior to excavation and may be subject to spacing and distances required by local governing agency (ices) standards.

3.2 FINISH GRADING

A. All grading and mounding with the exception of final planting shall be completed prior to soil preparation.

B. Planting areas shall be free of all weeds (plants not specified in planting areas), stones, stumps, roots, or other debris one (1) inch in diameter and greater.

C. Soil shall be graded to a smooth and even surface conforming to required finish grade. Finish grade adjacent to walks, paved areas, curbs, manholes, clean-outs, valve boxes, and similar features shall be one (1) inch below the surface in turf and two (2) inches below in ground cover/shrub areas. Grades between such features shall be carefully sustained and blended to eliminate abrupt changes.

D. Contractor shall allow for soil amendments when establishing sub-grade elevations. All planting areas shall have a finish grade conforming to approved plans and specifications after full settlement has occurred.

E. All planting areas adjacent to buildings shall be graded to drain away from the building at a minimum of two (2) percent slope, for a minimum of five (5) feet horizontal distance.

3.3 SOIL PREPARATION

A. Prepare soils per soils report recommendations. For bidding, or where no recommendations area provided, prepare soils as described: Cross-rip soil to a minimum depth of nine (9) inches to 12 inches. Thoroughly rototill a minimum of two (2) directions the following amendments (or those provided by the landscape architect) into the top six (6) inches of soil and irrigate thoroughly. (Per 1,000 square feet.)

4 cu. yds.	Nitrogen stabilized organic amendment derived from Redwood, Fir or Cedar sawdust
10 lbs.	Soil Sulfur
75 lbs.	Agricultural gypsum
20 lbs.	6-20-20 Fertilizer

B. Planting areas with slopes 2:1 and steeper shall not be soil prepared unless directed by Landscape Architect.

C. Contractor shall not work under muddy conditions.

D. Should 30 calendar days elapse between completion of soil preparation and commencement of planting, all areas shall be prepared again.

3.4 WEED ABATEMENT

A. If live perennial weeds exist on site at beginning of work, spray with a non selective translocative herbicide as recommended and applied by an approved licensed pest control advisor and applicator. Leave sprayed plants intact for at least 15 days. Clean and remove these existing weeds by mowing or grubbing off all plant parts at least ¼-inch below the surface of the soil.

B. Upon completion of soil preparation and planting of all specimen trees, begin weed abatement program by applying 200 pounds of a commercial fertilizer 21-0-0 per acre, per manufacturer's instructions.

C. Water all areas four (4) times daily for 21 consecutive days and until weed seeds have germinated. Cease watering for three (3) days. Spray a non selective translocative

herbicide to eradicate the germinated weeds. Translocation shall be seven to ten (7-10) days or an approved alternate time period.

D. Allow herbicide to kill all weeds. Rake or hoe off all dead weeds to a minimum depth of ¼-inch below the surface of the soil.

E. If perennial weeds or grasses still exist, re-water four (4) times daily for 14 consecutive days, until new growth appears. Reapply herbicide. Remove weeds after herbicide has had sufficient time to kill.

3.5 PLANTING OF TREES, SHRUBS AND VINES

A. Excavation: Planting holes shall have irregular, non-glazed sides, and shall be a minimum of twice the diameter, and 1-1/2 times the depth of the original plant container.

B. Planting procedure for container grown material:
1. Backfill plant pit with well-tilled on-site soil without amending to the depth of the rootball. Water thoroughly and compact backfill in such a manner so that after settling, the crown of the plant stem is two (2) inches above adjacent grade. Center plant in pit.
2. Uniformly blend amended backfill at a centralized location in minimum one (1) cubic yard lots. Backfill amendments shall be as indicated on the approved agronomic soils report. Mixing in plant pits or beds will not be permitted. Make available for inspection, all delivery slips and analytical data from approved laboratories for specified organic amendments. For bidding purposes use the following mixture:
3. Uniformly blend two pounds gypsum per cubic yard of backfill. Liberally dust side’s ad bottom with gypsum prior to planting. In upper 12 inches of backfill, add a soil blend of no more than 20 percent by volume Nitrogen stabilized organic amendment. Soil below this depth shall not contain organic amendment. Place slow release fertilizer tablets in upper 18 inches of backfill.
4. Backfill remainder of plant pit around the rootball with amended backfill. Firm down, eliminating air pickets. Do not pack. Form a shallow basin around the plant to hold enough water to saturate the rootball and backfill.
5. Plant tablets shall be required for all tree, shrub, and vine plantings. Plant tablets shall be placed from one (1) inch to three (3) inches below the finish surface within three (3) inches of the rootball. Application rate and nutrients shall be per the manufacturer's recommendation.
6. Immediately after planting, apply water to each tree and shrub by means of a hose. Apply water in a moderate stream in the planting hole until the material about the roots is completely saturated from the bottom of the hole to the top of the ground. Add additional amended backfill material as necessary to correct any settlement around rootball. Apply water in sufficient quantities and as often as seasonal conditions require to keep the plant areas moist at all times, well below the root system of grass and plants.

C. Planting Procedure for Field Grown Material: Plant in accordance with the above specification; however, do not use nitrogen stabilized organic amendment in the backfill mix.

3.6 GROUND COVERS

A. Ground cover plants shall not be allowed to dry out before or while being planted. Roots shall not be exposed to the air except while actually being placed in the ground. Wilted plants will not be accepted.

B. Plant ground covers in straight rows evenly spaced, and at intervals required by drawings, use triangular spacing.

C. Plant each rooted plant with its proportionate amount of flat soil. Immediately water after planting until entire area is soaked to full depth of each hole.

D. Protect plants from damage and trampling at all times.

3.7 TURF

A. General:

1. After soil preparation, Establishment of final grades, and weed abatement, carefully smooth all surfaces to be planted, roll area to expose soil depressions or surface irregularities. Re-grade as required. Prior to planting, the soil shall be loose and friable to receive turf.
2. Immediately prior to planting, evenly broadcast a pre-plant commercial fertilizer as recommended in the approved agronomic soils report. Rake in lightly. Avoid planting of turf on dry soil.
3. Turf shall be planted by seeding, hydroseeding, stolonizing, or sodding as indicated on the plans.

3.8 INSPECTION

A. All inspections herein specified shall be made by the Landscape Architect. The Contractor shall request inspection at least two (2) working days in advance of the time inspection is required.

B. Inspection will be required for the following parts of the work:

1. During the preliminary fine finish grading and soil preparation.
2. When fine finish grading and soil preparation are completed.
3. Plants after delivery to site (prior to planting), when shrubs and trees are spotted for planting, but before planting holes are excavated.
4. Specimen trees at source before delivery.
5. Planting areas prior to planting.
6. All landscape construction items, prior to the start of the Maintenance period.
7. Final inspection at the end of the Maintenance period provided that all previous deficiencies have been corrected.

3.9 WATERING

A. Watering to commence immediately after completion of job and to continue at a rate necessary to keep area moist without drying out or puddling. Normally irrigating ONCE AN HOUR for a short duration and continuing this procedure each and every day light hour, seven (7) days a week will be sufficient. This continual moist condition is to prevail each and every day until seeds are well rooted. After the rooting stage is completed, irrigation should still continue on the basis of at least once or twice a day until turf is well established.

B. Immediately after planting, apply water to each tree, shrub and ground cover by means of a hose. Apply water in a moderate stream in the planting hole until the material about the roots is completely saturated from the bottom of the hole to the top of the ground.

C. Water plants which cannot be watered efficiently with the existing water system by means of a hose.

D. Apply water in sufficient quantities, and as often as seasonal conditions require, and keep the ground wet at all times, well below the root system of grass and planting. Do not cause erosion damage in watering slopes.

3.10 ESTABLISHMENT/MAINTENANCE PERIOD

A. All areas landscaped by the Contractor under this contract shall be established and maintained for a duration of no less than 90 days after Final Approval.

B. Start of Establishment/Maintenance criteria:
1. Establishment period shall not commence until all elements of the project are completed in accordance with the approved plans. Upon satisfactory completion of the improvements and acceptance by Owner and local governing agency (ices) the Contractor will start the Establishment period.
2. Power, either temporary or permanent, to remote controllers shall be established prior to the beginning of the Establishment period.
3. Written approval by the Client and local governing agency (ices) must be obtained prior to the beginning of the Establishment period.
4. If the project Establishment fails to continuously meet standards required for start of Establishment the Establishment period shall be suspended. An additional Establishment period of up to 60- days shall begin when the Contractor has corrected all deficiencies.
5. Upon satisfactory completion of the plant Establishment period and acceptance by Owner, the contractor shall commence a 60-Day Maintenance Period. The 60-Day Establishment period will not be accepted by the Owner unless growth has achieved a minimum of 75 percent coverage of the appropriate project areas.

C. End of Maintenance:

On completion of the 90-day (minimum) Maintenance period and meeting of the criteria required for completion, the Client and local governing agency (ices) will inspect the project.

Deficiencies noted during inspection shall extend the Maintenance period.

End of maintenance shall occur only upon written acceptance by the Client and local governing agency (ices).

D. During the Establishment/Maintenance period the Contractor shall provide all watering, weeding, fertilizing, cultivating, spraying, and mowing necessary to keep the plants and turf in a healthy, weed free, growing condition and to keep the planted areas neat, edged, and attractive. All shrubs shall be pinched-pruned as necessary to encourage new growth and to eliminate rank sucker growth. Old wilted flowers and dead foliage shall be immediately pinched or cut off. All trees shall be pruned for structural form and health. Limbs shall be removed to the growth collar per good arboricultural practices.

E. Post plant Maintenance for the first year shall consist of a nitrogen-only fertilizer program. Apply 5 lbs. / 1000 sq. ft. ammonium sulfate at 30-day intervals beginning 30 days after planting. In the event that ground cover, trees, or shrubs exhibit iron chlorosis symptoms, necessary action shall be taken to correct the deficiency.

F. During the Establishment/Maintenance period, should the appearance of any plant indicate weakness, that plant or cutting shall be replaced immediately with a new healthy plant. Any trees or shrubs with damaged cambium shall be replaced immediately. At the end of the Maintenance period, all plant material shall be in a healthy growing condition and spaced as indicated on the plans.

G. Turf: Unless noted otherwise, all turf shall be mowed to a height recommended for the species at least once a week. Grass clippings shall be removed off-site. Maintenance height for all grass is two (2) inches, unless otherwise specified. All turf shall be trimmed around sprinklers, valve boxes and trees during entire Maintenance period.

H. Irrigation:

1. Contractor shall properly and completely maintain all irrigation systems, automatic and manual. A balanced watering program shall be maintained to ensure proper germination. Contractor shall be responsible for the irrigation system for the entire Maintenance period.
2. All controllers are to have each station individually adjusted on a weekly basis. System shall be set considering the application rate each area is capable of receiving. The system shall operate on short intervals, with the cycle repeating at a later time to reduce runoff.
3. Maintain all valve boxes and controllers free of debris. Boxes shall remain locked at times.

I. Site Maintenance:

1. All planted areas shall be kept neat and clean and free of all clippings, debris and trash.
2. All subsurface drains shall be periodically flushed with clear water to avoid build up of silt and debris. Keep all drain inlets clear of leaves, trash and other debris.
3. All paved areas shall be cleaned weekly of trash, debris and silt.
4. The Contractor shall be responsible for the elimination of vertebrate pests determined by the Landscape Architect to be detrimental and damaging to the area of development. Elimination shall be performed by safe, approved methods.

J. Utilities: All utility costs incurred during the Maintenance period shall be the responsibility of the contractor.

END OF SECTION 32 90 00

SECTION 33 11 00 - SITE WATER DISTRIBUTION UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Site water distribution systems located outside the building perimeter, extending to an existing water line or meter.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 01 35 93 - Off-site Improvement Procedures.
   3. Section 01 35 96 - Off-site Improvement Procedures (B-Permit).
   4. Division 22 – Plumbing.
   5. Section 31 23 13 - Excavation and Fill.
   6. Section 31 23 23 - Excavation and Fill for Utilities.
   7. Section 32 01 17 - Pavement Repair.
   8. Section 32 13 13 - Site Concrete Work.

1.2 SUBMITTALS

A. Shop Drawings: Submit site plan indicating locations of lines, valves, and related appurtenances.

B. Product Data: Manufacturer’s catalog data for materials. Include technical data for accessories, gaskets, joints and couplings.

C. Certificates: Certificates attesting that tests set forth in referenced publications have been performed, and the performance requirements have been satisfied.

1.3 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:
   1. American National Standards Institute (ANSI):
      a. ANSI H23.1 - Seamless Copper Water Tube.
   2. NSF International (NSF):
      a. ANSI/NSF 61 Drinking Water System Components – Health Effects.
      b. ANSI/NSF 372 Drinking Water System Components – Lead Content.
   3. American Society of Mechanical Engineers (ASME):
      a. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
      b. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
      c. ASME B16.26 - Cast Copper Alloy Fitting for Flared Copper Tubes.
      d. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings.
   4. American Society for Testing and Material (ASTM) International:
      a. ASTM A36 – Standard Specification for Carbon Structural Steel.
      b. ASTM A240 – Standard Specification for chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

c. ASTM A312 – Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
d. ASTM A536 - Standard Specification for Ductile Iron Castings.
e. ASTM B61 - Standard Specification for Steam or Valve Bronze Castings.
f. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
g. ASTM B75 - Standard Specification for Seamless Copper Tube.
h. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
i. ASTM B152 – Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar.
j. ASTM 17 – Standard Specifications for Copper Alloy Sand Castings for General Applications.
k. ASTM D1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
l. ASTM D2683 - Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
m. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
n. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
o. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
p. ASTM D3350 - Standard Specification for Polyethylene Plastics and Fittings Materials.
q. ASTM F2620 - Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
r. ASTM F2206 - Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE).
s. ASTM F477 - Standard Specification for Elastomeric Seals for Joining Plastic Pipe.
t. ASTM F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

5. American Water Works Association (AWWA):
   a. AWWA C104/A21.4 - Cement-Mortar Lining For Ductile-Iron Pipe and Fittings.
   b. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings
   c. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   d. AWWA C115/A21.15 - Standard for Flanged Ductile-Iron Pipe with Threaded Flanges.
   e. AWWA C153/A21.53 – American National Standard for Ductile-Iron Compact Fittings for Water Service
   f. AWWA C207 – Steel Pipe Flanges for Waterworks Service Sizes 4 In. Through 144 In.
   g. AWWA C500 - Metal Seated Gate Valves for Water Supply Service.
   h. AWWA C503 - Wet- Barrel Fire Hydrants.
   i. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 inches through 24 inches (50-mm through 600-mm) NPS.
   j. AWWA C510-89 - Standard for Double Check Valve Backflow-Prevention Assembly.
   k. AWWA C511 - Reduced-Pressure Principal Backflow-Prevention Assembly.
   l. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
   m. AWWA C800 - Underground Service Line valves and Fittings.

n. AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 4 In. Through 12 In., for Water Transmission and Distribution.
o. AWWA C901 – Polyethylene (PE) Pressure Pipe and Tubing, 3/4 In. Through 3 In., for Water Service.
p. AWWA M23 - PVC Pipe - Design and Installation.
q. AWWA M55 - PE Pipe - Design and Installation.

6. Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry:
   a. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves.
7. Uni-Bell PVC Pipe Association (UBPPA):
   a. UBPPA UNI-PUB-09 - Installation Guide for Gasketed-Joint PVC Pressure Pipe (C900).
8. Underwriters Laboratories Inc. (UL):
   a. UL 246 – Standard for Hydrants for Fire-Protection Service.
   b. UL 262 – Standard for Gate Valves for Fire-Protection Service.
   c. UL 312 – Standard for Check Valves for Fire-Protection Service.
9. National Pollutant Discharge Eliminations System (NPDES):
   a. Comply with storm water requirements of general permit for storm water discharges when flushing pipe systems including storm drains and maintaining logs.
10. Plastic Pipe Institute (PPI):
    a. TN-38 – Bolt Torque for Polyethylene Flanged Joints.
    b. TR-4 – Technical Report requirements of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipes.
    c. TR-33 – Technical Report for Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe.

B. Provide valves from the same manufacturer.

C. Manufacturer of plumbing products must be third-party certified to ANSI/NSF Standard 61, Section 9 certification, and ANSI/NSF 372 to demonstrate compliance with the federal requirements for lead contribution to drinking water, the Safe Drinking Water Act SDWA, and the California Health and Safety Code Section 11 68 75. No pipe, pipe fitting, or any other fitting or fixture intended to convey or dispose water for human consumption for drinking or cooking is allowed in the domestic plumbing system, if they do not meet the low lead definition of Health and Safety Code 11 68 75. Weighted average lead content of the wetted surface area of pipes, fittings and fixtures may not exceed 0.25 percent.

D. Qualifications of Manufacturer: Products used in the Work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production as reviewed by the ARCHITECT.

1.4 PRODUCT HANDLING

A. Store items above ground on platforms, skids, or other required supports.

B. Protect materials from direct sunlight.

C. Protect coating and linings on piping, fittings, and accessories from damage. Repair and/or replace damaged coatings or linings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipes, Fittings, and Joints:

1. P-3: Underground water service pipe sizes 4-inch and larger shall be C900 water service pipe material complying with AWWA C900, and ASTM D1784 Cell Class 12454B with tracer wire, NSF and UL listed. Piping shall be plain end or gasket bell end, pressure class 305 (DR14) with cast iron pipe equivalent outside diameter.

   PF-3: Fire Water Service, Domestic Water and Irrigation Service Line Fittings, Joints and Jointing Materials shall be Ductile-iron with mechanical joints conforming to AWWA C110/A21.10 or AWWA C153/A21.53, C900 compatible, and shall have cement mortar lining conforming to AWWA C104/A21.4, standard thickness unless otherwise indicated on Drawings.

   a. Pipe joints shall be push on as specified in ASTM D3139.
   b. Joints between pipe and metal fittings, valves, and other accessories shall be mechanical joints as specified in AWWA C111/A21.11.
   c. Provide each joint connection with an elastomeric gasket suitable for the bell or coupling installation.
   d. Gaskets for push on joints for pipe shall conform to ASTM F477.
   e. Gaskets for push on joints and compression type joints or mechanical joints for connections between pipes and metal fittings, valves, and other accessories shall be as specified in AWWA C111/A21.11.
   f. Sleeve-type mechanically coupled joints may be provided instead of push-on joints on plain-end PVC plastic joints. Comply with requirements of ASTM D3139.
   g. Comply with installation guide UBPPA UNI-PUB-09.

      Manufacturer: JM Eagle, Diamond Plastics, North American Pipe, or equal.

2. P-4: Aboveground water service pipe shall be Type 316L Stainless Steel, Schedule 40 water pipe, marked with manufacturer's identification and fittings. Manufacturer's representative shall instruct installers and certify them for joint installation. Piping system shall be provided with a five-year manufacturer’s material warranty.

   Manufacturer: Viega, or equal.

   PF-4: Type 316L Stainless Steel, Schedule 40 Press Fittings. For water service piping systems, provide with EPDM seals. Manufacturer's representative shall instruct installers and certify them for joint installation.

   Manufacturer: Viega, or equal.

B. Gates Valves for PVC:
   1. Non-rising stem type with resilient wedge gates or iron body bronze wedge gates and mechanical joint ends conform to AWWA C500.
   2. Non-rising stem type with mechanical joints ends shall conform to AWWA C509.

3. Valves designed for a working pressure of 175 PSI shall be inside-screw type with operating nut, and resilient wedge type gate. Valve shall be provided with mechanical joints as required for the pipe to which it is intended to connect.
4. Valves with UL listing of 262 shall conform to AWWA C500. Valves shall open by counter-clockwise rotation of valve stem.
5. Stuffing boxes shall be provided with O-ring stem seals and shall be bolted and constructed to permit easy removal of parts for repair.
6. Sleeve type mechanical couplings may be provided instead of mechanical and push on joint ends.
7. Valve ends and gaskets for connection to sleeve type mechanical couplings shall conform to specified requirements for the joint or coupling.

C. Gate Valves in Valve Pits:
1. Outside screw and yoke rising stem type valves with resilient wedge gates and flanged ends shall conform to AWWA C500.
2. Outside screw and yoke rising stem type valves with flanged ends shall conform to AWWA C509.
3. Outside screw and yoke type Valves with double disc gates or split-wedge type gate and flanged ended ends shall be designed for 175 psi and conform to UL 262.
4. Provide valves with hand wheels that open by counterclockwise rotation of the valve stem.
5. Stuffing boxes shall be provided with O-ring stem seals and shall be bolted and constructed to permit easy removal of parts for repair.

D. Check Valves for PVC:
1. Valves shall be swing-check type conforming to AWWA C508 or UL 312.
2. Valves shall be provided with cast iron or steel body and cover, flanged ends and clear port opening.
3. Valves shall be designed for a working pressure of 175 PSI.

E. Fire Hydrants:
1. Before procurement, verify approval issued by the County of Los Angeles or Fire Department having jurisdiction.
2. Hydrants shall be wet barrel types conforming to AWWA C503 or UL 246.
3. Only 1¾-inch pentagonal nuts are to be provided on stems and protective caps.
4. Specified hydrants:
   a. Clow/Rich # 850 or 860
   b. James Jones #J3700 Fluted Spool
   c. Equal.

F. Valve Boxes: 14 ¾-inch by 20-inch by 12-inch cast concrete with cast iron, traffic grade cover marked “WATER” (for use over water valves).
1. Brooks 36-H MB with No. 36-T cast iron cover EISEL 363.5, or equal.

G. Mechanical Thrust Restraint:
1. Restraint shall be incorporated into the follower gland.
2. Restraint shall consist of individually actuated wedges that increase resistance to pull out as internal pressure or external forces increase.
3. Gland shall be ductile iron conforming to ASTM A536.
4. Provide twist off nuts and tee-head bolts of the same size to ensure proper actuating of restraint devices.
5. Restraining device shall be provided with pressure rating equal to that of the pipe on which it is installed.
6. Restraining gland shall be UL listed.

7. Mechanical thrust restraint devices shall be EBAA Iron “Megalug” or equal.

H. Restraint Device Adapters:
1. Restrained flange adapters shall be provided instead of threaded or welded flange spool pieces on plain end of ductile iron or PVC pipe.
2. Flange adapters shall be manufactured of ductile iron conforming to ASTM A536 and be provided with flange bolt circles compatible with AWWA C115/A21.15.
3. Restraint of flange adapter shall consist of a multiple number of individually actuated gripping wedges to maximize restraint capability.
4. Torque limiting actuating screws shall be provided to insure proper initial set of gripping wedges.
5. Flange adapter shall be capable of deflection during assembly or permit lengths of pipe to be field cut to allow at least 0.6 inch of gap between end of pipe and mating flange without affecting integrity of seal.
6. Flange adapter shall be provided with a safety factor of at least 2:1 for rated pressure.
7. Restraint device adapters shall be EBAA Iron “Megaflange”, or equal.

I. Tracer Wire for Nonmetallic Pipes: Tracer wires shall be continuous solid copper wire type THWN, 12 AWG gauge, with heat and moisture resistance insulation. Blue plastic covered for domestic water and red for fire sprinkler. (Aluminum wire is prohibited). Provide in sufficient length to be continuous over each installed section of nonmetallic pipe.

J. Pipe markers shall be a concrete plaque inscribed with the word “WATER.”

K. Water Service Line Materials:
1. Water Service Line Piping Material: Refer to article 2.01.A within this section.
2. Water Service Line Appurtenances:
a. Corporation stops shall be ground key type; manufactured of bronze conforming to ASTM B61 or ASTM B62; and suitable for the working pressure of the system. Ends shall be suitable for solder-joint or flared tube compression type joint connection. Threaded ends for inlet and outlet of corporation stops shall conform to AWWA C800; coupling nut for connection to flared copper tubing and shall conform to ASME B16.26.
b. Goosenecks shall be type K copper tubing. Joint ends for goosenecks shall be as required for connecting to corporation stop and service line. Where multiple gooseneck connections are required for individual service, connect goosenecks to service line through brass or bronze branch connection; the total clear area of branches shall be at least equal to clear area of service line. Length of goosenecks shall be as indicated or required.
c. Curb or service stops shall be ground key, round way, inverted key type; bronze, conforming to ASTM B61 or ASTM B62; and rated at 150 psi. Ends shall be as required for connection to service piping. Arrow shall be cast into body of curb or service stop indicating direction of flow.
d. Gate valves 2.5-inch and larger shall be MSS SP-80, Class 150, solid wedge, or resilient wedge gate, and non-rising stem. Valves shall be provided with flanged end connections. Provide hand wheel operators if easily accessible. Provide operating nut if inside a vault, pit or valve box.
e. Gate valves in valve pits 2-inch, and smaller shall be MSS SP-80, Class 150, bronze, solid wedge, inside screw, rising stem. Valves shall be provided with flanged end connections or threaded end connections with union on one side of valve and hand wheel operator.
f. Valve boxes shall be provided at each gate valve installed underground. Valve boxes shall be a size suitable for valve on which it is installed.

L. Water meter will be installed by water purveyor for the area, unless noted otherwise.

M. Strainers:

1. STR-1 Description: Wye type with Monel or Stainless Steel strainer cylinder (manufacturer's standard mesh), and gasketed machine strainer cap. Where indicated on Drawings, provide with valved (globe valve) blow out piping, same size as blow out plug:

   2-inch and smaller: C.M. Bailey #100-A, bronze, 250 pound, or ductile iron with fusion bonded epoxy coating.

   2 ½-inch and larger: Watts 77F-DI-FDA-125 pound, or other ductile iron fusion bonded epoxy coated flanged strainer, conforming to ASTM A312 for the strainer body, and ASTM A240 for the stainless steel strainer element. (No iron body strainer shall be used on potable water that is not fusion bonded epoxy coated inside and out.)

   C.M.Bailey, Armstrong, Wilkins, Watts, or equal.

2. STR-2 "Y" pattern, cast iron bodies, 125 psi, Monel screen 16 square. mesh. Open area at least twice the cross-sectional area of IPS pipe in which strainer is installed and may be woven wire or perforated type. Screwed ends for sizes up to 2-inch, flanged ends for 2 ½-inch and larger perforations, in accordance with the following:

   Bailey #100, Armstrong, Rp & C , Keckley, or equal.

3. STR-3 Bucket type, flange, semi-steel body, 125 psi, stainless steel screen with 1/8 inch diameter perforations (mounted above grade for water service). All sizes, for lines serving fire sprinkler risers:

   Bailey #1, Zurn 150 Series, Rp 7 C, Watts 97fb-Fsfe, or equal.

   STR-42" and larger: Watts 077-F-SS Stainless steel flange type strainer, or equal conforming to ASTM A312 for strainer body, ASTM A240 for the SS strainer element and ASTM A36 for base flange material.

N. Backflow Preventer Assemblies:

1. Assembly shall be provided with flanged connections, ductile iron with fusion bonded epoxy coated construction, bronze, or stainless steel.
2. Backflow preventer shall be suitable for cold water working pressure of 175 psi.
3. Internal parts shall be designed for replacement without removing valves from line.
4. Double check backflow preventer assembly shall consist of two independently acting spring cam or poppet style check valves, 2 shut-off valves and 4 test cocks. Check valve shall be designed to provide drip tight closure against reverse flow, low pressure drop at maximum flow capacity. Spring-loaded checks shall cause valve to seal against a higher inlet pressure than outlet pressure when there is no flow.
5. Double check backflow preventer assembly shall meet AWWA Standard C510-89. Assembly shall be Ames 2000ss, Febco 850, Watts 709, Wilkins 350, or equal.
6. Reduced pressure backflow preventer assembly shall consist of two check valves located between two shut-off valves with an area of reduced pressure between two check valves and a relief device arranged to discharge to atmosphere.
   a. Comply with AWWA Standard C511.
   b. Fluctuation in piping pressure shall not cause cycling. Backflow preventer shall automatically maintain low pressure zone to positively prevent backflow of

water into system. Assembly shall automatically indicated failure of any part vital to backflow prevention by the continuous discharge relief device.

c. Reduced pressure backflow preventer assembly shall be Cla-Val Model RP-4, or equal.

7. Backflow prevention assemblies (devices), shall be tested and certified by a certified backflow tester, and a test report shall be provided to the water agency having jurisdiction. Testing shall be performed in the presence of the Project Inspector.

PART 3 - EXECUTION

3.1 EXCAVATION, BACKFILLING AND COMPACTING

A. Conform to requirements in Section 31 23 23 - Excavation and Fill for Utilities or Section 31 23 13 - Excavation and Fill.

3.2 PIPE INSTALLATION

A. Project site water lines shall terminate approximately 5 feet from buildings, unless otherwise indicated on Drawings. Temporarily cap or plug terminals for future connection to building.

3.3 CLEARANCES OF WATER LINE

A. Building or Structures: Two feet.

B. Parallel to Sewer Line:
1. Water line 4-inch or less in diameter shall not be installed in a common trench with the building sanitary drain unless the bottom of the water line is at least 12 inches above the top of the building sanitary drain or where the water line is installed on a solid shelf excavated on one side of the common trench with a minimum clear horizontal distance of 12 inches from the building sanitary drain.
2. Water lines 6-inch and larger in diameter shall be separated from the Project site sanitary sewer, receiving more than one building sanitary drain or acid pipeline, in accordance with the requirement of the State of California, Human and Welfare Agency, Department of Health Services.

C. Crossing Sewer Line:
1. A water line shall be separated from sanitary sewer in accordance with the requirements of the State of California Administrative Code, Title 22, Section 64630(e)(2).
2. Install water line a minimum of 12 inches clear, above or below a sanitary sewer.
3. A water line 6-inch or greater in diameter, crossing under a Project site sanitary sewer line, shall be installed with joints located at least 10 feet away from each side of the sanitary sewer line.
4. A water line 6-inch or greater in diameter, crossing over a Project site sanitary sewer line, shall be installed with joints located at least 4 feet away from each side of a purple pipe or sanitary sewer line.

D. Install water lines no closer than 10 feet horizontally clear from the edge of sewage leach fields, seepage pits, and septic tanks.

3.4 PIPE INSTALLATION AND JOINING

A. Install all piping and fitting systems according to the manufacturer requirement.

B. Remove fins and burrs from pipe and fittings.

C. Clean piping, fitting, valves, and accessories before installing. Maintain items in a clean condition.

D. Provide proper facilities for lowering sections of pipe into trenches. Do not drop into piping, fittings, or other materials into trenches. Accurately cut pipe and install without springing or forcing. Replace any piping or fitting that does not provide sufficient space for proper installation of joining material.

E. Blocking or wedging between bells and spigots is not permitted. Install bell and spigot pipe with bell end pointing in the direction of flow.

F. Install piping to the lines and grades indicated or required. Low points and dips are not permitted. Support piping at proper elevation and grade with secure and uniform supports. Wood support blocking is not permitted. Where sand cement slurry will not be furnished for backfill, install piping so that full length of each section of pipe and each fitting will solidly rest on pipe bedding. Excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where indicated or required for installation. Provide proper allowances and devices for expansion and contraction of piping and systems.

G. Maintain trenches free of standing water until pipe joints have been installed.

H. At the end of each day close open ends of pipe with temporary caps of the same material as the pipe.

I. Do not install piping when trench or weather conditions prevent proper installation.

3.5 INSTALLATION OF TRACER WIRE AND PIPE MARKERS

A. Tracer Wire: Install continuous length of tracer wire for full length of each run of nonmetallic pipe. Fasten wire to top of pipe in such a manner that it will not be displaced during construction operations. Wire shall be fastened to pipe at not greater than 20-foot intervals. Wire shall terminate above finished grade with a 12-inch lead taped around each riser. Provide a tracer wire to grade under a permanent marker where straight-line transitions of metallic to non-metallic pipe are installed.

B. Underground Pipe Markers: Provide markers at grade where non-metallic pipe is installed and for each horizontal change in direction.

3.6 CONNECTIONS TO EXISTING WATER LINES

A. After Project Inspector has inspected installation, perform connections to servicing water lines. Schedule service shutdown for connecting new system at a time causing minimum disruption.

3.7 INSTALLATION OF HDPE WATER SERVICE LINE

A. All HDPE pipe and fittings shall be cut, joined, and installed in accordance with the manufacturer's recommendations. Joining, and laying of polyethylene pipe shall be accomplished by personnel experienced and certified in working with polyethylene pipe systems.

B. Jointing:
1. All HDPE pipe shall be joined to itself by the heat fusion process which produces homogeneous, seal, leak tight joints. Tie-ins between sections of HDPE pipe shall be made by butt fusion whenever possible.
2. The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. A record or certificate of training for the fusion operator must be provided that documents training to the fundamentals of ASTM F 2620.
3. The employer of the fusion machine operator is responsible for the fusion joint quality of the fusion weld made by that individual. The employer is responsible for documenting all training and qualification records for that individual, including compliance to any code requirements for fusion/bonder operators.
4. All HDPE fusion equipment operators shall be qualified to the procedure used to perform pipe joining. Fusion equipment operators shall have current, formal training on all fusion equipment employed on the project approved by manufacturer. Training received more than two years prior to operation with no evidence of activity within the past 6 months shall not be considered current.

C. Installation:
1. Buried HDPE pipe and fittings shall be installed in accordance with AWWA Manual of Water Supply Practices M55 Chapter 8. The Design Window identified in AWWA M55 Chapter 5 shall be considered acceptable design and installation conditions.
2. Unless required by design documents, no thrust blocks shall be placed in the HDPE pipe system since the fused system is fully restrained.
3. All appurtenances (tees, elbows, services, valves, etc.), must be independently supported and shall not rely on the pipeline and its connections for this support. Excessive stresses may be encountered when appurtenances are inadequately supported.

3.8 INSTALLATION OF C900 PLASTIC WATER SERVICE LINE

A. Unless otherwise indicated, install pipe and fittings as specified and in accordance with UBPPA UNI-B-09 and AWWA M23, Chapter 7, “Installation”.

B. Jointing:
1. Provide push on joints with elastomeric gaskets specified for this type of joint, furnishing either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings. For pipe-to-pipe push on joint connections, provide pipe with push on joint ends furnished with factory installed bevel; for push on joint connections to metal fittings, valves and other accessories, square cut spigot end off pipe end.
2. Provide push on joint lubricant recommended by manufacturer.
3. Install push on joints for pipe-to-pipe connections in accordance with UBPPA UNI-PUB-09 and AWWA M23, Chapter 7, "Installation."
4. Install push on joints for connection to fittings, valves, and other accessories in accordance with requirements of UBPPA UNI-PUB-09 and with applicable requirements of AWWA C600.

5. Compression-type joints/mechanical-joints with gaskets, glands, bolts, nuts and internal stiffeners shall be installed in accordance with the requirements of UBPPA UNI-PUB-09 and AWWA C600 and Appendix A to AWWA C 111/A21.11.
   a. Square cut spigot off end of pipe for compression-type joint/mechanical-joint connections and do not re-bevel.
6. Sleeve-type mechanical couplings shall be provided in strict accordance with coupling manufacturer's recommendations using internal stiffeners as specified for compression-type joints.

C. Provide mechanical thrust restraint devices for anchorage and piping unless thrust blocks are indicated on the Drawings. Thrust blocks shall be installed in accordance with the requirements of UBPPA UNI-PUB-09 except that size and location of blocks shall be as indicated. Thrust blocks shall be provided as specified in Section 32 13 13 - Site Concrete Work.

3.9 INSTALLATION OF VALVES

A. Provide gate valves conforming to AWWA C500 and UL 262 in accordance with AWWA C600 for valve and fitting installation and with recommendations of AWWA C500 Appendix "Installation, Operation, and Maintenance of Gate Valves".

B. Provide gate valves conforming to AWWA C600 in accordance with AWWA C509 for valve and fitting installation and with recommendations of AWWA C500 Appendix "Installation, Operation, and Maintenance of Gate Valves".

C. Provide gate valves on PVC water service lines in accordance with AWWA M23 Chapter 7, "Installation."

D. Provide check valves and fittings in accordance with applicable requirements of AWWA C600 unless noted otherwise on the Drawings.

E. Provide gate and check valve joints as specified for the type of joints between pipe and fittings.

3.10 INSTALLATION OF HYDRANTS

A. Install hydrants according to requirements of AWWA C600 for hydrant installation and as indicated. Provide joints as specified for the type of joints between pipe and fittings.

B. Install hydrant with a 6-inch key gate valve between 4 and 10 feet from the hydrant.

3.11 INSTALLATION OF BACKFLOW PREVENTERS

A. Install reduced pressure backflow preventers to comply with RULE 16D of LADWP in the jurisdictional boundaries of Los Angeles Department of Water and Power.

3.12 INSTALLATION OF STRAINERS:

A. Strainers shall be installed on each water line downstream of the meter, above grade at the pressure regulating station. When a pressure regulating station (assembly) is not provided,

"wye" type flange strainer shall be provided, with a shut off valve on the inlet and the outlet side.

B. If the water line is serving fire sprinkler risers or hydrants, then an approved fire service strainer shall be used: Watts 97DB-FSFE, or equal.

3.13 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. For complete requirement and procedure refer to section 22 10 00, article 3.12.

3.14 ELECTROLYSIS PREVENTION

A. A minimum 6-inch long brass nipple shall be installed at locations specified or as required. Flanges shall be provided with a complete insulating component consisting of; gasket bolt sleeves and bolt washers. Dielectric insulators shall be installed at locations indicated or as required. Dielectric fittings are prohibited.

B. Where steel or cast iron below grade connects to copper or brass piping above grade, the transition from steel or cast iron pipe to copper or brass pipe shall be installed in an above grade accessible location.

C. Underground connections between dissimilar metals shall be in accessible yard boxes.

D. Above ground dielectric connections shall be exposed.

3.15 TESTS AND INSPECTIONS

A. Provide labor, equipment, materials, test equipment and incidentals required for performing required field tests.

B. Tests shall not be performed for five days after concrete thrust blocks have been installed.

C. Testing Procedure: Water service lines shall be tested in accordance with applicable specified standard.
   1. Test water service lines in accordance with applicable requirements of AWWA C600. No leakage is permitted.
   2. Pressure testing: Before pressure test, fill portion of piping being tested with water for a minimum of 24 hours. Provide hydrostatic pressure of at least 50 psi greater than the maximum working pressure of tested system, but no less than 200 psi hydrostatic test pressure for system piping of 2-inch in diameter and larger. Provide and maintain hydrostatic test pressure for at least two hours to ensure no leakage of any portion of piping or appurtenances under pressure test.

3.16 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.17 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 33 40 00 - STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes storm drainage piping; sub-surface drains; metal covers, grates and frames; catch basins; box culverts; manholes, and BMPs.
   1. Best Management Practices (BMPs):
      a. Proprietary Detention BMPs - Precast Concrete.
      b. Cartridge Media Filters.
      c. Hydrodynamic Separation Devices.
      d. Catch Basin Inserts.
      e. Downspout Filters.
      f. Stormwater Interceptors.
      g. Proprietary Retention/Infiltration BMPs – Polypropylene or Polyethylene.
      h. Proprietary Retention/Infiltration BMPs – Precast Concrete.
      i. Proprietary Biotreatment Devices.
   2. Closed-circuit television inspection of storm drain lines.

1.2 RELATED REQUIREMENTS

A. Division 01 - General Requirements.

B. Section 01 35 93 - Off-site Improvement Procedures.

C. Section 01 35 96 - Off-site Improvement Procedures (B-Permit).

D. Section 01 74 17 – BMP Implementation Plan.

E. Section 01 74 18 – Water Pollution Control.

F. Section 22 10 00 - Plumbing.

G. Section 31 23 13 - Excavation and Fill.

H. Section 31 23 23 - Excavation and Fill for Utilities.

I. Section 32 01 17 - Pavement Repair.

J. Section 32 13 13 - Site Concrete Work.

1.3 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials.

B. ASME: American Society of Mechanical Engineers.

C. ASTM: American Society for Testing and Materials.

D. BMP: Stormwater Best Management Practice.

E. CBC: California Building Code.

F. CCTV: Closed-Circuit Television.

G. DET: Detention BMP.

H. DWV: Drain, Waste, and Vent.

I. FILT: Filter BMP.

J. GS: Gravity Separator.

K. HDPE: High Density Polyethylene.

L. IAPMO: International Association of Plumbing and Mechanical Officials.

M. IOR: Inspector of Record.

N. NPS: Nominal Pipe Size.

O. OAR: OWNER's Authorized Representative.

P. PE: Polyethylene.

Q. Post Construction BMP: Devices installed by the CONTRACTOR for storm water management to be left on site after construction completion.

R. PP: Polypropylene.

S. PVC: Poly Vinyl Chloride.

T. RET: Retention.

U. SDR: Standard Dimensions Ratio.

V. VEG: Vegetative.

W. OWNER: Los Angeles Unified School District.

X. SWPPP: Storm Water Pollution Prevention Plan.

1.4 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
1. ASHTO M 252: Geotextile Specification for Highway Applications.
2. AASHTO M 294: Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.
3. AASHTO M 330: Standard Specification for Polypropylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.

B. American Society for Testing and Materials International (ASTM):
1. ASTM A888: Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
2. ASTM C14: Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe.
3. ASTM C443: Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
4. ASTM C564: Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
5. ASTM C76: Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
6. ASTM C857: Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
7. ASTM C858: Standard Specification for Underground Precast Concrete Utility Structures.
8. ASTM C891: Standard Practice for Installation of Underground Precast Concrete Utility Structures.
9. ASTM D2564: Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
10. ASTM D2665: Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
11. ASTM D2855: Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
12. ASTM D3034: Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
13. ASTM D3212: Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
14. ASTM D448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
15. ASTM F1866: Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings.
16. ASTM F2306: Standard Specification for 12 to 60 in. [300 to 1500 mm] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications.
17. ASTM F2418: Standard Specification for Polypropylene Corrugated Wall Stormwater Collection Chambers.
18. ASTM F2764: Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications.
19. ASTM F2787: Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers.
20. ASTM F2881: Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications.
21. ASTM F2922: Standard Specification for Polyethylene Corrugated Wall Stormwater Collection Chambers.
22. ASTM F477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
23. ASTM F656: Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
24. ASTM F794: Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.

C. Cast Iron Soil Pipe Institute (CISPI):

1. CISPI 301: Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
2. CISPI 310: Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

D. The International Association of Plumbing and Mechanical Officials (IAPMO):
1. IAPMO IS 6: Hubless Cast Iron Sanitary and Rainwater Systems - Installation Standards.

E. Standard Specifications for Public Works Constructions (Greenbook):
1. Section 202: Masonry Materials.
2. Section 206: Miscellaneous Metal Items.
3. Section 207: Pipe.
4. Section 208: Pipe Joint Types and Materials.
5. Section 210: Paint and Protective Coatings.
6. Section 306: Underground Conduit Construction.

1.5 SUBMITTALS

A. Shop Drawings: Submit site plan denoting locations of lines, valves, and appurtenances.

B. Product Data: Manufacturer’s catalog data for all required materials. Include technical data for accessories, information concerning gaskets, joints and couplings.

C. Certificates: Certificates attesting that tests set forth in referenced publication have been performed and the results required by design have been met.

D. Closeout Documents: At Substantial Completion submit to the OAR two CD’s and one hard copy of the documents indicated in paragraphs 1 through 5 below:
1. Maintenance Log: Provide Microsoft Excel Spreadsheet including the following information:
a. Maintenance log and upkeep records of the installed Post Construction BMPs. Include the following headers as a minimum: “Date of Service”, “Location of BMP”, “Type of Maintenance or Service”, “Notes”, “Next Scheduled Preventive Maintenance Due”, and “Inspector Signature”.
b. Maintenance Requirements: Include the following headers as a minimum: “BMP Description”, “Location of BMP and Map Grid Location” and “Type of Maintenance or Service Needed”, i.e.; weekly, monthly, quarterly, etcetera. “Stock No.”, “Manufacturer Contact Information”, along with “Frequency” namely: weekly, monthly, quarterly, etcetera and “Special Instructions”.
2. Maintenance Manuals: Provide Maintenance Manual for storm drainage BMP components installed along with requirements, replacement or maintenance schedule and plans with the location of each BMP component. This manual shall include product information cut sheet, shop drawings, vendor information for each component and warranty.
3. Record drawings: ‘As-Builts’ site plan(s) showing Post Construction BMP. Provide a copy of marked record set with red pencil identifying any variations from design documents.
4. Training Documentation:
a. OWNER attendees sign off training sheet.
b. Two DVD’s of materials covered in the training and components installed.
5. Post-Construction BMP Maintenance Plan: Submit complete Plan per Attachment “A”, edit per As-Built conditions and provide missing information.

6. Records of Closed-Circuit Television Inspection: At Substantial Completion submit to the OAR three DVD's of Closed-circuit television inspections performed. Include the following information:
   a. Electronic Media Recordings: Visual and audio record of the entire length of pipe. For existing laterals identify problem areas, such as roots, cracks, fractures, broken pipe, and other unusual conditions found.
   b. Digital Photographs of the pipe condition, connections, points of interest and defects found. Indicate distance of defects to a point of reference such as face of building or mainline. Provide the Digital Photographs after fixing the defective pipes.
   c. Inspection Log: Provide written report including:
      1) Date and time of inspection.
      2) Name of School, Project, CONTRACTOR, and operator name.
      3) Location, material and size of pipe.
      4) Description of defects found and attempts to fix them.

1.6 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction, current edition.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic products, pipes, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle all products according to manufacturer's written rigging instructions.

1.8 TRAINING OF OWNER PERSONNEL

A. At Substantial Completion and when the storm drainage system is fully operational, knowledgeable representatives from the CONTRACTOR and manufacturer(s) of the components specified and installed at the site shall provide up to 8 hours of training. Date, time and location for the training shall be coordinated through the project OAR. Have OWNER attendees sign off training sheet and provide a copy to the OAR.

B. Training period shall cover but not be limited to the following:
   1. Explain the operation of storm drainage system and its design intent.
   2. Explain the maintenance requirements of every component of the system.
   3. Provide recommendations of practices to minimize or eliminate negative impact on the system.
   4. Provide maintenance schedule as recommended by the manufacturers for every component and review it with OWNER's Maintenance and Operations staff.
   5. Conduct a site walk, identify every component of the system and demonstrate its operation.
   6. Training shall be conducted with the use of Maintenance log and Maintenance manual.

1.9 SURPLUS MATERIALS

A. Provide enough additional materials for each component of BMP that requires replacement or service during the first year.

1.10 ATTACHMENTS

A. The following attachments are included at the end of Section 33 40 00.

PART 2 - MATERIALS AND PRODUCTS

2.1 PIPING MATERIALS

A. General: Minimum 5 feet away from building boundaries. For piping within 5 feet from building boundaries, and interior piping refer to Division 22 plumbing sections. Provide piping system in conformance with Section 207 - Pipe and Section 208 - Pipe Joint Types and Materials of the Standard Specifications for Public Works Construction. All Soil-tight pipes shall be provided with joints that are function of opening size, channel length, and backfill particle size. A backfill material containing a high percentage of fine-graded soils requires investigation for the specific type of joint to be used to guard against soil infiltration, including the requirement for fabric-wrapped joints.

B. PVC (Poly Vinyl Chloride) SDR-35 Pipe, 6” through 15”:
1. Conform to ASTM D3034.
2. Gasketed Joints: Elastomeric gasket joints conforming to ASTM D3212.
3. Gaskets: Chloroprene conforming to ASTM F477.
4. Approved manufacturers: Charlotte pipe and foundry, Harvel Plastics Inc., JM Eagle, Spears Manufacturing Company, or equal.

2.2 BEDDING MATERIAL FOR PIPE

A. General: Conform to the requirements of Section 31 23 13 - Excavation and Fill or Section 31 23 23 - Excavation and Fill for Utilities, as required.

B. Approved manufacturers and products:
1. Propex Fabrics, Inc.: Geotex 451.
2. TenCate Geosynthetics Americas: Mirafi 140N.
3. US Fabrics, Inc.: 120NW.
4. Equal products.

2.3 STORMWATER TREATMENT SYSTEMS /BMPS

A. DET-1: Proprietary Detention BMPs – Reinforced Precast Concrete, approved manufacturers and products:
1. Jensen Precast: Precast-Concrete-Detention-Reservoir.
2. Oldcastle Precast Inc.: Storm Capture-Detention.
3. Storm Trap: Single-Trap-Detention.
4. Equal products.

B. FILT-2: Cartridge Media Filters, approved manufacturers and products:

1. Baysaver Technologies Inc.: Bayfilter.
2. Contech: Storm Filter.
3. OldCastle Precast Inc.: Perk Filter.
4. Equal products.

C. GS-1: Hydrodynamic Separation Devices, approved manufacturers and products:
1. ADS-Baysaver Technologies Inc.: Barracuda S Series.
2. Contech: CDS.
3. Hydro International: First Defense HC (High Capacity).
4. Jensen Precast: JDS.
5. Oldcastle Precast Inc.: DVS.
6. Equal products.

D. GS-2: Catch Basin Inserts, approved manufacturers and products:
1. AbTech Industries: UUF DI-DO.
2. ADS-FlexStorm: FlexStorm Pure or Catch-it.
3. Aquashield Inc.: Aqua-Guardian.
4. Ecosense International: EcoSense International's Catch Basin Insert.
5. EnviroPod Inc.: LittaTrap.
6. Oldcastle Precast Inc.: FLoGard, or GISB.
7. UltraTech International Inc.: Ultra-Drain Guard.
8. Equal products.

E. GS-3: Downspout Filters, approved manufacturers and products:
1. Oldcastle Precast Inc.: FLoGard +Plus.
2. Equal products.

F. GS-5: Stormwater Interceptors, approved manufacturers and products:
1. Jensen Precast: JPHV-stormwater-interceptors-with-bypass.
2. Oldcastle Precast Inc.: Storm Capture Detention.
3. Oldcastle Precast Inc.: NSBB, Nutrient Separating Baffle Box.
4. Storm Trap: Single-Trap-Detention.
5. Equal products.

G. RET-4: Drywells
1. Pre-Cast Liner: Reinforced 4000 PSI concrete. 48" I.D., 54" O.D.
2. Overflow/Riser Pipe: Minimum 6" I.D. Schedule 40 Poly Vinyl Chloride (PVC) solid wall with debris shield.
3. Drainage Screen: Minimum 6" I.D., Schedule 40 PVC slotted screen with 0.120-inch slots continuous, with a minimum of 160 slots per foot.
4. Rock: Clean washed rock uniformly graded between 3/8" and 1-1/2".
5. Absorbent: Hydrophobic petrochemical sponge with minimum four (4) quart capacity used in all chambers.
6. Approved manufacturers and products:
   a. Torrent Resources: MaxWell.
   b. Equal products.

H. RET-7a: Proprietary Retention/Infiltration BMPs – Polypropylene or Polyethylene
1. Molded PP or PE with open bottom. Thermoplastic Corrugated Wall Chambers (Chambers): Provide in conformance with ASTM F 2418 "Standard Specification for Polypropylene Corrugated Wall Stormwater Collection Chambers", ASTM F 2922 "Standard Specification for Polyethylene Corrugated Wall Stormwater Collection Chambers", and ASTM F 2787 "Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers".

2. Filtering Material: ASTM.D448, washed, crushed stone or ¾" to 2" gravel. For more information refer to plans, and manufacturer installation manual.
3. Filter Mat, applicable to isolator/main row: Geotextile woven or spun filter fabric, in one or more layers. For more information refer to plans, and manufacturer installation manual.
4. Provide non-woven geotextile fabric around the entire system to prevent migration of fines into the rock voids. For more information refer to plans, and manufacturer installation manual.
5. Pipe Systems: Perforated manifold, header, and lateral piping complying with AASHTO M 252 for NPS 10 and smaller, AASHTO M 294 for NPS 12 to NPS 60. Include proprietary fittings, couplings, seals, and filter fabric.
6. Approved manufacturers and products:
   a. ADS - Storm Tech: MC3500, MC4500, SC740 or DC780.
   b. Contech: ChamberMaxx.
   c. NDS: StormChambers SC34 or SC44.
   d. Prinsco: HydroStor HS180 or HS75.
   e. Triton: S22 or S29.
   f. Equal products.

I. RET-7b: Proprietary Retention/Infiltration BMPs – Reinforced Precast Concrete, approved manufacturers and products:
1. Jensen Precast: Precast-Concrete-Arches.
2. Oldcastle Precast Inc.: Storm Capture Infiltration.
3. StormTrap: Single-Trap-Infiltration.

   1. Equal products

J. VEG-6: Proprietary Biotreatment Devices, approved manufacturers and products:
1. BioClean: Modular Wetlands System.
   a. Infiltration media shall be ARCOSA.
2. Contech: Filterra Bioretention Systems.
   a. Infiltration media shall be Filterra Media consist of a combination of natural sand, gravel, and organic materials.
3. DeepRoot Urban Landscape: Silva Cell 2.
4. Oldcastle: BioPod Underground.
   a. Infiltration media shall be StormMix.
5. StormTree: Tree Filter System.
   a. Grates shall be Hot-dip galvanize steel.
   b. Infiltration media shall be CocoGro Coir Fiber.
6. Equal products.

2.4 MANHOLES

A. Provide round reinforced concrete manhole with an H-20 traffic rated hatch & solid cover of minimum 30-inch in diameter with holes of maximum ½-inch in diameter.

2.5 MISCELLANEOUS MATERIALS

A. Metal Covers, Grates, Frames and Accessories:
1. Conform to Section 206 - Miscellaneous Metal Items of the Standard Specifications for Public Works Construction.
2. Hot-dip galvanize steel parts after fabrication in accordance with Section 210 - Paint and Protective Coatings of the Standard Specifications for Public Works Construction.

3. Grates and Frames:
   a. Vandal-proof design and construction.
   b. ADA compliant, in conformance to CBC 11B-302.3.
   c. Rated for vehicular traffic on areas intended for use by motor vehicles.
   d. Hot-dip galvanized.

B. Concrete, Mortar and Related Materials: Conform to Section 32 13 13 - Site Concrete Work.

C. Manhole Brick Mortar, Grout, and Plaster: Conform to Standard Specifications for Public Works Construction, Section 202 - Masonry Materials.

D. Underground Concrete Structures: Shall be precast and rated for H-20 traffic loading and applicable soil loads. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.

2.6 NAMEPLATES

A. Stainless steel or aluminium nameplate permanently fastened to BMP showing the following information:
1. BMP ID number and BMP type.
2. Next service day followed by a 1-inch by 4-inch long blank space.
3. Manufacturer name, model number, telephone number and stock ID number.
4. Installation or production date.
5. 1-inch by 4-inch blank space for OWNER’s use.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. CONTRACTOR shall arrange for a preconstruction meeting with the manufacturer’s representative to review the basic principles for proper installation of Underground BMP type products prior to any installation.

B. Underground Concrete modules shall be installed in accordance with manufacturer’s instructions and the current ASTM C891 procedures.

3.2 EXCAVATION, BACKFILLING AND COMPACTING

A. Conform to the requirements of Section 31 23 13 - Excavation and Fill or Section 31 23 23 - Excavation and Fill for Utilities, as required.

3.3 INSTALLATION OF PIPE

A. Conform to Section 306 - Underground Conduit Construction of the Standard Specifications for Public Works Construction.

B. Non-ferrous drainpipe installed with less than 12 inches of cover to finish grade shall be provided with a 4-inch thick concrete pipe encasement.

3.4 DRAINAGE APPURTENANCES

A. Catch basins, junction chambers, manholes, box culverts, outlet chambers and other drainage structures: Construct as indicated on Drawings and as specified in Section 32 13 13 - Site Concrete Work, and in compliance with the Standard Specifications for Public Works Construction, Section 303 - Concrete and Masonry Construction.

B. Ensure that Post Construction BMP have a visible identifying manufacturer tag with product identification, manufacturer contact information, date of last service and date of next service due.

3.5 STORMWATER TREATMENT SYSTEMS/BMPs

A. RET-4: Drywells
1. The drilled holes shall be the diameter shown on the plans. The holes shall be drilled in a manner to maintain maximum permeability of soils.
2. The drainage pipe, drainage screen, and filter fabric sleeve shall be suspended during backfilling operations. The drainage pipe shall extend to within 2 feet of the total depth of the drywell. The rock backfill shall be placed to prevent buckling and breakage of the drainage pipe, screen, and filter fabric.
3. The overflow/riser pipe shall be installed within the drywell chamber to create a sump with depth per project detail (6’ minimum).
4. The pre-cast liner shall be centered in drilled shaft and the sections carefully aligned to maximize the bearing surfaces of the liner walls.
5. The ring and grate shall be set to the rim elevation shown on the plans or to match existing grades and shall be secured to the cone with mortar.
6. Upon completion of each drywell, a lay of UV stabilized Mirafi® 100X fabric shall be placed over the grated inlet and banded in place. The fabric shall not be removed until after paving the landscaping operations are completed.

3.6 ABANDONED DRAINAGE LINES AND STRUCTURES

A. Cap or plug existing drain lines that are cut and abandoned and remove existing drainage structures that are abandoned.

3.7 CLOSED-CIRCUIT TELEVISION INSPECTION

A. Coordinate with OAR time and date of inspection. Project Inspector shall be present during the CCTV inspection.

B. Clean laterals by hydraulic jet.

C. Perform internal closed-circuit television inspection of lateral from the building to the public mainline. Record drain line in its entirety with no breaks or interruptions. Move camera at a speed no greater than 30 feet per minute, stopping for a minimum of ten seconds to record pipe connections, defects, and points of interest.

D. Maintain technical quality, sharp focus and distortion free picture. Pan, tilt, and rotate as necessary to best view and evaluate connections, defects and points of interest.

E. Minimum Requirements for Closed-circuit Television Equipment:

1. Television camera specially designed for pipe inspections, and operative in 100 percent humidity conditions.
2. Camera and television monitor capable of producing minimum 470H-line resolution color video picture.
3. Camera capable to inspect lines as small as three inches up to 70 feet from storm drain mainline.
4. Camera lighting shall be suitable to allow clear picture of inner wall at least ten feet in front.

F. Defective Work:
1. New Lines: Defective Work found shall be repaired at CONTRACTOR's expense. Perform a new closed-circuit television inspection at no cost to OWNER.
2. Existing Laterals:
a. If roots, sludge, or sediment material or other defect not related to the Work of this project impedes inspection, withdraw camera, restart inspection from opposite end and notify OAR of defects found.
b. If obstruction or stoppage was caused by Work related to this project, remove obstruction at no cost to OWNER. Perform a new closed-circuit television inspection at CONTRACTOR's expense.

3.8 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

B. Maintain Post Construction BMP after installation and keep a maintenance log to be turned over to OAR at Substantial Completion.

3.9 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

PART 9: CONSTRUCTION DRAWINGS



ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET ALTADENA, CA, 91001

PROJECT DIRECTORY

OWNER:	ALTADENA LIBRARY DISTRICT 600 E MARIPOSA STREET ALTADENA, CA 91001 CONTACT: NIKKI WINSLOW PHONE: (626) 798-0833	CIVIL ENGINEER:	VCA ENGINEERS, INC. 1041 S. GARFIELD AVE., SUITE 210 ALHAMBRA, CA 91801 CONTACT: VIRGIL C. AOANAN PHONE: (323) 729-6098
PROGRAM MANAGER:	RACHLIN PARTNERS 8540 NATIONAL BOULEVARDD CULVER CITY, CA 90232 CONTACT: JENNIFER PEARSON PHONE: (310) 240-3400	STRUCTURAL ENGINEER:	MIYAMOTO INTERNATIONAL, INC. 1450 HALYARD DRIVE, SUITE ONE WEST SACRAMENTO, CA 95691 CONTACT: TRACI WONG PHONE: (833) 270-8848
ARCHITECT:	ANDERSON BRULÉ ARCHITECTS 676 W 9TH STREET CLAREMONT, CA 91711 CONTACT: MARK SCHOEMAN PHONE: (408) 535-2909	ACOUSTICS, AV & IT:	WAVEGUIDE, LLC 6060 CENTER DR., SUITE 870 LOS ANGELES, CA 90045 CONTACT: BRANDON MOSST PHONE: (310) 213-0112
LANDSCAPE ARCHITECT:	DEPARTMENT OF SPACE 480 N INDIAN HILL BLVD, SUITE 2B CLAREMONT, CA 91711 CONTACT: BEN MCCOY PHONE: (909) 532-1460	MEP, LIGHTING, T-24 ENERGY COMPLIANCE:	DCGA ENGINEERS, INC. 4750 EAST ONTARIO MILLS PARKWAY ONTARIO, CA 91764 CONTACT: CHRIS VILLALOBOS PHONE: (909) 987-0017

PROJECT INFORMATION

ADDRESS: 600 E MARIPOSA STREET
ALTADENA, CA 91001

ASSESSOR'S PARCEL NUMBER: 5840-010-900

ZONING DISTRICT: R-1-10000

PROJECT DESCRIPTION:

THE RENOVATION OF THE ALTADENA MAIN LIBRARY INCLUDES A MULTI-USE COMMUNITY SPACE, MAKER AND FABRICATION SPACES, ADDITIONAL MEETING SPACES THROUGH-OUT, AND A 155 SQUARE FEET ADDITION AT THE SOUTHEAST CORNER, AND THE FULL RENOVATION OF THE EXISTING BUILDING.

THE PROJECT ADDRESSES TECHNOLOGY, ACCESS, AND SEISMIC RESISTANCE. ALL SYSTEMS ARE BEING UPGRADED INCLUDING MECHANICAL, PLUMBING, (INCLUDING ADDITIONAL ACCESSIBLE RESTROOMS), ELECTRICAL, AND STRUCTURAL.

THE SITE IS BEING UPGRADED WITH THE RENOVATION OF THE PEDESTRIAN BRIDGES, UPDATED PLANTINGS AND IRRIGATION, AND THE ADDITION OF EXTERIOR FUNCTIONAL SPACES, SUCH AS AN EXTERIOR DECK.

VICINITY MAP



DEFERRED SUBMITTALS

DEFERRED SUBMITTALS SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO SUBMITTING TO THE CITY OR FIRE DEPARTMENT FOR APPROVAL.

DEFERRED SUBMITTALS INCLUDE:
- FIRE SPRINKLERS
- FIRE ALARM SYSTEM

CONTRACTOR SHALL PAY ALL PERMIT FEES NOTED FOR ABOVE DEFERRED SUBMITTALS TO THE FIRE DEPARTMENT

CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING SIGNAGE PERMIT

SHEET INDEX

GENERAL		S7.30	DECK DETAILS
G000	COVER SHEET	MECHANICAL	
G001	CODE ANALYSIS & GENERAL NOTES	M001	MECHANICAL GENERAL NOTES SYMBOLS AND AVVREVIATIONS
G100	SITE CODE PLAN	M002	MECHANICAL SCHEDULES
G110	CODE PLAN	M003	MECHANICAL DETAILS
G120	CALGREEN	M004	MECHANICAL DETAILS AND PIPING DIAGRAM
G121	CALGREEN	M200	LOWER LEVEL MECHANICAL DEMOLITION PLAN
G122	CALGREEN	M201	MAIN LEVEL MECHANICAL DEMOLITION PLAN
CIVIL		M202	LOWER LEVEL MECHANICAL PLAN
C-1.0	GENERAL NOTES, LEGENDS AND ABBREVIATIONS	M203	MAIN LEVEL MECHANICAL PLAN
CD-1.0	DEMOLITION LAN_BASE	M300	MECHANICAL DEMOLITION ROOF PLAN
CD-1.1	DEMOLITION LAN_ALTERNATIVE	M301	MECHANICAL ROOF PLAN
C-2.0	SITE CONTROL PLAN_BASE	M401	TITLE 24
C-2.1	SITE CONTROL PLAN_ ALTERNATIVE	PLUMBING	
C-3.0	SITE GRADING PLAN_BASE	P001	PLUMBING GENERAL NOTES SYMBOLS AND ABBREVIATIONS
C-3.1	SITE GRADING PLAN_ALTERNATIVE	P002	PLUMBING SCHEDULES & DETAILS
C-4.0	SITE UTILITY PLAN	P003	PLUMBING DETAILS
C-5.0	MISCELLANEOUS DETAILS	P200	LOWER LEVEL PLUMBING DEMOLITION PLAN
C-5.1	MISCELLANEOUS DETAILS	P201	MAIN LEVEL PLUMBING DEMOLITION PLAN
LANDSCAPE		P202	LOWER LEVEL PLUMBING PLAN
L001	LANDSCAPE AND TREE DEMOLITION PLAN	P203	MAIN LEVEL PLUMBING PLAN
L002	ARBORIST REPORT	P300	PLUMBING DEMOLITION ROOF PLAN
L003	IRRIGATION DEMOLITION PLAN-L1.01	P301	PLUMBING ROOF PLAN
L101	SITE CONSTRUCTION PLAN	ELECTRICAL	
L102	SITE CONSTRUCTION PLAN	E001	ELECTRICAL GENERAL
L110	SITE CONSTRUCTION DETAILS	E002	ELETRICAL SYMBOLS LIST AND ABBREVIATIONS
L111	SITE CONSTRUCTION DETAILS	E003	LIGHTING FIXTURE SCHEDULE AND NOTES
L112	SITE CONSTRUCTION DETAILS	E004	SINGLE LINE DIAGRAM AND FEEDER SCHEDULE
L200	IRRIGATION PLAN	E005	BRANCH CIRCUIT VOLTAGE DROP CALCULATIONS
L210	IRRIGATION DETAILS	E111	ELECTRICAL SITE PLAN
L300	PLANTING PLAN	E200	LOWER LEVEL ELECTRICAL DEMOLITION PLAN
L310	PLANTING DETAILS	E201	MAIN LEVEL ELECTRICAL DEMOLITION PLAN
ARCHITECTURAL		E202	LOWER LEVEL LIGHTING PLAN
A000	ABBREVIATIONS, SYMBOLS, AND CONVENTIONS	E203	MAIN LEVEL LIGHTING PLAN
A100	SITE PLAN	E204	LOWER LEVEL POWER PLAN
A110	SITE DETAILS	E205	MAIN LEVEL POWER PLAN
A160	DEMO FLOOR PLAN - LOWER LEVEL	E206	ELECTRICAL ROOF PLAN
A161	DEMO FLOOR PLAN - MAIN LEVEL	E401	ELECTRICAL DETAILS
A170	DEMO ROOF PLAN - LOW ROOF	E402	ELECTRICAL DETAILS
A171	DEMO ROOF PLAN - HIGH ROOF	E403	ELECTRICAL DETAILS
A180	DEMO RCP - LOWER LEVEL	E501	PANEL SCHEDULES
A181	DEMO RCP - MAIN LEVEL LOWER CEILING	E601	TITLE 24
A182	DEMO RCP - MAIN LEVEL UPPER CEILING	E602	TITLE 24
A200	FLOOR PLAN - LOWER LEVEL	E603	TITLE 24
A201	FLOOR PLAN - MAIN LEVEL	AUDIO/VISUAL REFERENCE	
A202	DIMENSION PLAN - LOWER LEVEL	AV000	LEGEND
A203	DIMENSION PLAN - MAIN LEVEL	AV101	LOWER LEVEL - AV SYSTEMS
A210	ROOF PLAN - LOW ROOF	AV102	MAIN LEVEL - AV SYSTEMS
A211	ROOF PLAN - HIGH ROOF	AV102A	MAIN LEVEL ALT - AV PLAN
A220	RCP - LOWER LEVEL	AV201	TELE MEETING ROOM ENLARGED PLANS
A221	RCP - MAIN LEVEL LOWER CEILING	AV202	STAFF MEETING ROOM ENLARGED PLANS
A222	RCP - MAIN LEVEL UPPER CEILING	AV203	DIGITAL SIGNAGE ENLARGED PLANS
A230	FINISH PLAN - LOWER LEVEL	AV204	GAMING ROOM ENLARGED PLANS
A231	FINISH PLAN - MAIN LEVEL	AV205	COMMUNITY ROOM ENLARGED PLANS
A240	FINISH LEGEND	AV206	OPEN WORK AREA ENLARGED PLANS
A290	ENLARGED PLANS	AV207	DIGITAL SIGNAGE 2 ENLARGED PLANS
A291	ENLARGED PLANS	AV301	TELE MEETING ROOM SECTIONS AND ELEVATIONS
A292	ENLARGED PLANS	AV302	STAFF MEETING ROOM SECTIONS AND ELEVATIONS
A300	EXTERIOR ELEVATIONS	AV303	DIGITAL SIGNAGE SECTIONS AND ELEVATIONS
A400	BUILDING SECTIONS	AV304	GAMING ROOM SECTIONS AND ELEVATIONS
A401	BUILDING SECTIONS	AV305	COMMUNITY ROOM SECTIONS AND ELEVATIONS
A410	WALL SECTIONS	AV306	OPEN WORK AREA SECTIONS AND ELEVATIONS
A411	WALL SECTIONS	AV307	DIGITAL SIGNAGE 2 SECTIONS AND ELEVATIONS
A450	STAIR AND ELEVATOR SECTIONS, ENLARGED PLANS, AND DETAILS	AUDIO/VISUAL INFRASTRUCTURE	
A451	ELEVATOR DETAILS	EAV000	LEGEND
A452	STAIR & RAILING DETAILS	EAV100	LOWER LEVEL - EAV PLAN
A500	ACCESSIBILITY DETAILS AND MOUNTING HEIGHTS	EAV102	MAIN LEVEL - EAV PLAN
A501	SIGNAGE AND MOUNTING HEIGHTS	EAV102A	MAIN LEVEL ALT - EAV PLAN
A510	ENLARGED TOILET ROOM PLANS AND ELEVATIONS	EAV201	TELE MEETING ROOM ENLARGED PLANS
A511	ENLARGED TOILET ROOM PLANS AND ELEVATIONS	EAV202	STAFF MEETING ROOM ENLARGED PLANS
A520	INTERIOR ELEVATIONS	EAV204	GAMING ROOM ENLARGED PLANS
A521	INTERIOR ELEVATIONS	EAV205	COMMUNITY ROOM ENLARGED PLANS
A522	INTERIOR ELEVATIONS	EAV203	DIGITAL SIGNAGE ENLARGED PLANS
A523	INTERIOR ELEVATIONS	EAV206	OPEN WORK AREA ENLARGED PLANS
A524	INTERIOR ELEVATIONS	EAV207	DIGITAL SIGNAGE 2 ENLARGED PLANS
A525	INTERIOR ELEVATIONS	EAV301	TELE MEETING ROOM SECTIONS AND ELEVATIONS
A526	INTERIOR ELEVATIONS	EAV302	STAFF MEETING ROOM SECTIONS AND ELEVATIONS
A600	DOOR TYPES, FRAME TYPES, AND SCHEDULES	EAV303	DIGITAL SIGNAGE SECTIONS AND ELEVATIONS
A610	EXTERIOR WINDOW TYPES	EAV304	GAMING ROOM SECTIONS AND ELEVATIONS
A611	EXTERIOR WINDOW TYPES	EAV305	COMMUNITY ROOM SECTIONS AND ELEVATIONS
A612	INTERIOR WINDOW TYPES	EAV306	OPEN WORK AREA SECTIONS AND ELEVATIONS
A700	EXTERIOR DETAILS	EAV307	DIGITAL SIGNAGE 2 SECTIONS AND ELEVATIONS
A710	EXTERIOR WINDOW DETAILS	TELECOM	
A720	ROOF DETAILS	T000	TELECOM SYMBOLS AND NOTES
A721	ROOF SCREEN DETAILS	T001	TELECOM STANDARDS (1 OF 2)
A730	DECK DETAILS	T002	TELECOM STANDARDS (2 OF 2)
A800	PARTITION TYPES	T100	TELECOM SITE PLAN
A801	INTERIOR PARTITION DETAILS	T101	TELECOM LOWER LEVEL FLOOR PLAN
A810	INTERIOR DETAILS	T102	TELECOM MAIN LEVEL FLOOR PLAN
A830	CEILING DETAILS	T102A	TELECOM MAIN LEVEL FLOOR PLAN - ADD ALTS
A831	CEILING DETAILS	T201	TELECOM ENLARGED PLANS
A832	CEILING DETAILS	T301	TELECOM RACK ELEVATIONS
A850	CASEWORK DETAILS		
A851	CASEWORK DETAILS		
STRUCTURAL			
S0.00	ISOMETRIC VIEW		
S0.01	GENERAL NOTES		
S0.02	GENERAL NOTES		
S0.03	GENERAL MATERIAL NOTES		
S0.11	TYPICAL FOUNDATION & SOG DETAILS		
S0.13	TYPICAL CONCRETE DETAILS		
S0.21	TYPICAL MASONRY DETAILS		
S0.31	TYPICAL STRUCTURAL STEEL DETAILS		
S0.32	TYPICAL STRUCTURAL STEEL DETAILS		
S0.33	TYPICAL STEEL STAIR DETAILS		
S0.41	TYPICAL METAL DECK DETAILS		
S0.43	TYPICAL CHANNEL STRUT DETAILS		
S0.51	TYPICAL COLD-FORMED STEEL DETAILS		
S0.52	TYPICAL INTERIOR COLD-FORMED STEEL DETAILS		
S1.01	FOUNDATION PLAN		
S1.02	FIRST FLOOR FRAMING PLAN		
S1.03	LOW ROOF FRAMING PLAN		
S1.04	HIGH ROOF FRAMING PLAN		
S1.05	SKYLIGHT ROOF & A/C SCREEN FRAMING PLAN		
S3.00	WALL ELEVATIONS		
S3.01	FRAME ELEVATIONS		
S3.02	BUILDING SECTIONS		
S3.03	BUILDING SECTIONS		
S3.04	BUILDING SECTIONS		
S3.05	BUILDING SECTIONS		
S3.06	BUILDING SECTIONS		
S3.07	BUILDING SECTIONS		
S3.08	BUILDING SECTIONS		
S3.09	BUILDING SECTIONS		
S3.10	BUILDING SECTIONS		
S5.00	FOUNDATION DETAILS		
S5.10	FRAMING DETAILS		

CLIENT REVIEW

THIS DESIGN SET HAS BEEN REVIEWED & APPROVED BY:

CLIENT 1 & CLIENT 2

ANDERSON BRULÉ ARCHITECTS MAY PROCEED WITH WORK IN THE NEXT PHASE.

DATE:

SIGNATURE:

ABA

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN 3/31/25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

COVER SHEET

SCALE:

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

G000

6/24/2024 5:34:03 PM

1. APPLICABLE CODES

CODE REQUIREMENTS INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

2022 CALIFORNIA BUILDING STANDARDS CODE (CBC)
2022 CALIFORNIA MECHANICAL CODE (CMC)
2022 CALIFORNIA PLUMBING CODE (CPC)
2022 CALIFORNIA ELECTRICAL CODE (CEC)
2022 CALIFORNIA ENERGY CODE

2. OTHER STANDARDS

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN)
2022 CALIFORNIA FIRE CODE AND ADOPTED AMENDMENTS

3. BUILDING ANALYSIS DATA BLOCK:

OCCUPANCY CLASSIFICATION AND USE:
PER 2022 CBC SECTION 303.4 — **A-3, B NONSEPARATED OCCUPANCIES**

CONSTRUCTION TYPE:
PER 2022 CBC TABLE 303.4 — **TYPE VB FULLY SPRINKLERED**

ALLOWABLE BUILDING HEIGHT IN FEET
ABOVE GRADE PLANE PER TABLE 504.3
S (WITHOUT AREA INCREASE) — **60'-0"**
PROVIDED — **+/-27'-6"**

ALLOWABLE NUMBER OF STORIES
ABOVE GRADE PLANE PER 2022 CBC TABLE 504.4
S (WITHOUT AREA INCREASE) — **2 STORIES**
PROVIDED — **2 STORIES**

ALLOWABLE AREA FACTOR IN
SQUARE FEET PER TABLE 506.2
SM (WITHOUT HEIGHT INCREASE) PER FLOOR — **18,000 SF**
PROVIDED PER FLOOR (ENCLOSED AREA) — **17,464 SF (MAIN LEVEL)**
8,181 SF (LOWER LEVEL)

25,645 SF TOTAL

REFER TO SHEET G110 FOR OCCUPANT LOAD

4. GENERAL BUILDING LIMITATIONS (BUILDING HEIGHT AND AREA)

SECTION 504.1 GENERAL
THE HEIGHT, IN FEET, AND THE NUMBER OF STORIES OF A BUILDING SHALL BE DETERMINED BASED ON THE TYPE OF CONSTRUCTION, OCCUPANCY CLASSIFICATION AND WHETHER THERE IS AN AUTOMATIC SPRINKLER SYSTEM INSTALLED THROUGHOUT THE BUILDING.

SECTION 504.3 - HEIGHT IN FEET - THE MAXIMUM HEIGHT, IN FEET, OF A BUILDING SHALL NOT EXCEED THE LIMITS SPECIFIED IN TABLE 504.3.

BUILDING HEIGHT / STORIES
2022 CBC - TABLE 504.3

ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY	CONSTRUCTION TYPE	MAXIMUM HEIGHT	PROPOSED HEIGHT	MAXIMUM STORIES	PROPOSED STORIES
A-3	VB	60 FT	27' - 6"	2	2

NONSEPARATED OCCUPANCY PER 508.3 - FOLLOWING MOST RESTRICTIVE A-3 OCCUPANCY USE

5. CONSTRUCTION TYPE

TYPE VB FULLY SPRINKLERED NFPA 13 SYSTEM

TABLE 601 - FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

FIRE RESISTANCE RATING
PER 2022 CBC - TABLE 601

BUILDING ELEMENT	TYPE VB CONSTRUCTION
PRIMARY STRUCTURAL FRAME	0
BEARING WALLS • EXTERIOR • INTERIOR	 0 0
NONBEARING WALLS & PARTITIONS • EXTERIOR	 0
NONBEARING WALLS & PARTITIONS • INTERIOR	 0
FLOOR CONSTRUCTION & ASSOCIATED SECONDARY STRUCTURAL MEMBERS	0
ROOF CONSTRUCTION & ASSOCIATED SECONDARY STRUCTURAL MEMBERS	0
SHAFT ENCLOSURES - PER CBC 713.4	1
STAIR ENCLOSURES - PER CBC 1023.2	1

TABLE 602 - FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE.

SECTION 602.5 TYPES V
TYPE V CONSTRUCTION IS THAT TYPE OF CONSTRUCTION IN WHICH THE STRUCTURAL ELEMENTS, EXTERIOR WALLS AND INTERIOR WALLS ARE OF ANY MATERIALS PERMITTED BY THIS CODE.

EXTERIOR WALL RATING REQUIREMENTS PER 2022 CBC - TABLE 705.5

OCCUPANCY	TYPE OF CONSTRUCTION	BEARING/ LOCATION	FIRE SEPARATION DISTANCE	EXTERIOR WALL RATING REQUIRED
A-3	VB	NORTH	N/A	0-HR
		EAST	11 FT	0-HR
		SOUTH	N/A	0-HR
		WEST	14'-3"	0-HR

NOTE: NORTH (FRONT SIDE) OF BUILDING IS MEASURED ROUGHLY FROM CENTERLINE OF STREET FOR FDS ON LAKECHIME DR

6. FIRE AND SMOKE PROTECTION FEATURES

705.2.2 TYPE III, IV OR V CONSTRUCTION

PROJECTIONS FROM WALLS OF TYPE III, IV OR V CONSTRUCTION SHALL BE OF ANY APPROVED MATERIAL.

MINIMUM DISTANCE OF PROJECTION
PER 2022 CBC - TABLE 705.2

FIRE SEPARATION DISTANCE - FSD (FEET)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 TO LESS THAN 2	PROJECTIONS NOT PERMITTED
2 TO LESS THAN 3	24 INCHES
3 TO LESS THAN 5	24 INCHES PLUS 8 INCHES FOR EVERY FOOT OF FSD BEYOND 3 FEET OR FRACTION THEREOF
5 OR GREATER	40 INCHES

SECTION 705.3 BUILDING ON THE SAME LOT
FOR THE PURPOSES OF DETERMINING THE REQUIRED WALL AND OPENING PROTECTION, PROJECTIONS AND ROOF-COVERING REQUIREMENTS, BUILDING ON THE SAME LOT SHALL BE ASSUMED TO HAVE AN IMAGINARY LINE BETWEEN THEM.

WHERE A NEW BUILDING IS TO BE ERECTED ON THE SAME LOT AS AN EXISTING BUILDING, THE LOCATION OF THE ASSUMED IMAGINARY LINE WITH RELATION TO THE EXISTING BUILDING SHALL BE SUCH THAT THE EXTERIOR WALL AND OPENING PROTECTION OF THE EXISTING BUILDING MEET THE CRITERIA AS SET FORTH IN SECTIONS 705.5 AND 705.8.

FOR GROUP A, E, H, I, L AND R OCCUPANCIES, HIGH-RISE BUILDINGS, AND OTHER APPLICATIONS LISTED IN SECTION 1.11 REGULATED BY THE OFFICE OF THE STATE FIRE MARSHAL, EXTERIOR WALLS SHALL BE FIRE-RESISTANCE RATED IN ACCORDANCE WITH TABLES 601 AND 602 AND THIS SECTION. THE REQUIRED FIRE-RESISTANCE RATING OF EXTERIOR WALLS SHALL BE RATED FOR EXPOSURE TO FIRE FROM BOTH SIDES.

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION PER 2019 CBC - TABLE 705.8

FIRE SEPARATION DISTANCE (FT)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA
5 TO LESS THAN 10[E,F,J]	UNPROTECTED, SPRINKLERED (UP, S)	25%
10 TO LESS THAN 15[E,F,G,J]	UNPROTECTED, SPRINKLERED (UP, S)	45%
15 TO LESS THAN 20[F,G,J]	UNPROTECTED, SPRINKLERED (UP, S)	75%
20 TO LESS THAN 25[F,G,J]	UNPROTECTED, SPRINKLERED (UP, S)	NO LIMIT

UP, S = UNPROTECTED OPENINGS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1.

SECTION 705.8.3 UNPROTECTED OPENINGS
WHERE UNPROTECTED OPENINGS ARE PERMITTED, WINDOWS AND DOORS SHALL BE CONSTRUCTED OF ANY APPROVED MATERIALS. GLAZING SHALL CONFORM TO THE REQUIREMENTS OF CHAPTERS 24 AND 26.

SECTION 903.2.1.3 GROUP A-3
AN AUTOMATIC SPRINKLER SYSTEM SHALL BE PROVIDED THROUGHOUT STORIES CONTAINING GROUP A-3 OCCUPANCIES AND THROUGHOUT ALL STORIES FROM THE GROUP A-3 OCCUPANCY TO AND INCLUDING THE LEVELS OF EXIT DISCHARGE SERVING THAT OCCUPANCY WHERE ONE OF THE FOLLOWING CONDITIONS EXISTS:

- THE FIRE AREA EXCEEDS 12,000 SQUARE FEET (1115 M2).
- THE FIRE AREA HAS AN OCCUPANT LOAD OF 300 OR MORE
- THE FIRE AREA IS LOCATED ON A FLOOR OTHER THAN A LEVEL OF EXIT DISCHARGE SERVING SUCH OCCUPANCIES.
- THE STRUCTURE EXCEEDS 12,000 SQUARE FEET (1155 M2), CONTAINS MORE THAN ONE FIRE AREA CONTAINING EXHIBITION AND DISPLAY ROOMS, AND IS SEPARATED INTO TWO OR MORE BUILDINGS BY FIRE WALLS OF LESS THAN FOUR-HOUR FIRE-RESISTANCE RATING WITHOUT OPENINGS.

SECTION 903.3 - INSTALLATION REQUIREMENTS
AUTOMATIC SPRINKLER SYSTEMS SHALL BE DESIGNERED AND INSTALLED IN ACORDANCE WITH SECTIONS 903.3.1 THROUGH 903.3.9.

7. SPRINKLERS

SECTION 903.3.1 - STANDARDS
SPRINKLER SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 UNLESS OTHERWISE PERMITTED BY SECTIONS 903.3.1.2 AND 903.3.1.3 AND OTHER CHAPTERS OF THIS CODE, AS APPLICABLE.

SECTION 903.3.1.1 - NFPA 13 SPRINKLER SYSTEMS
WHERE THE PROVISIONS OF THIS CODE REQUIRE THAT A BUILDING OR PORTION THEREOF BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH THIS SECTION, SPRINKLERS SHALL BE INSTALLED THROUGHOUT IN ACCORDANCE WITH NFPA 13 AS AMENDED IN CHAPTER 35 EXCEPT AS PROVIDED IN SECTION 903.3.1.1.1 AND 903.1.1.2.

8. EGRESS

SECTION 1006.3.2 - EGRESS BASED ON OCCUPANT LOAD
EACH STORY AND OCCUPIED ROOF SHALL HAVE THE MINIMUM NUMBER OF SEPARATE AND DISTINCT EXITS, OR ACCESS TO EXITS, AS SPECIFIED IN TABLE 1006.3.2. A SINGLE EXIT OR ACCESS TO A SINGLE EXIT SHALL BE PERMITTED IN ACCORDANCE WITH SECTION 1006.3.3. THE REQUIRED NUMBER OF EXITS, OR EXIT ACCESS STAIRWAYS OR RAMPS PROVIDING ACCESS TO EXITS, FROM ANY STORY OR OCCUPIED ROOF SHALL BE MAINTAINED UNTIL ARRIVAL AT THE EXIT DISCHARGE OR A PUBLIC WAY.

MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY
2022 CBC - TABLE 1006.3.3

OCCUPANT LOAD PER STORY	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY
1-500	2

9. PLUMBING CALCULATIONS

2022 CALIFORNIA PLUMBING CODE

CHAPTER 4: PLUMBING FIXTURES AND FIXTURE FITTINGS

SECTION 422.0 MINIMUM NUMBER OF REQUIRED FIXTURES

422.1 FIXTURE COUNT - PLUMBING FIXTURES SHALL BE PROVIDED FOR THE TYPE OF BUILDING OCCUPANCY AND IN THE MINIMUM NUMBER SHOWN IN TABLE 422.1. THE TOTAL OCCUPANY LOAD AND OCCUPANCY CLASSIFICATION SHALL BE DETERMINED IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE. OCCUPANCY CLASSIFICATION NOT SHOWN IN TABLE 422.1 SHALL BE CONSIDERED SEPARATELY BY THE AUTHORITY HAVING JURISDICTION.

THE MINIMUM NUMBER OF FIXTURES SHALL BE CALCULATED AT 50 PERCENT MALE AND 50 PERCENT FEMALE BASED ON THE TOTAL OCCUPANT LOAD.

OCCUPANCY CALCULATIONS

HYBRID CALCS - CPC 2022 TABLE 4-1 & CBC 2022 TABLE 1004.5 FOR READING & STACK AREAS

USE	TOTAL AREA (SF)	OCCUPANT LOAD FACTOR	NUMBER OF OCCUPANTS (ROUNDED TO THE NEAREST WHOLE NUMBER)	
A - UNCONCENTRATED / NON FIXED SEATING *(CONFERENCE, LOUNGE, PORTABLE SEATING/ TABLE SPACE)*	4345	30	145	A-3 TOTAL # OF OCCUPANTS: 339
A-3 - READING (CH. 10 CBC)	8645	50	173	
A-3 - STACKS (CH. 10 CBC)	2100	100	21	
B - *(OFFICE, SALES/SOLICITING, ADMINISTRATION, FOOD PROCESSING, COURTROOM, AMBULATORY CLINIC)*	2820	150	19	B TOTAL # OF OCCUPANTS: 19

ACCESSORY AREAS EXCLUDED IN PLUMBING CALCULATIONS: HALLWAYS, RESTROOMS, & STORAGE

PLUMBING FIXTURE SUMMARY

(2022 CPC TABLE 422-1)

OCCUPANCY TYPE	NO. OF OCCUPANTS		WATERCLOSETS			URINALS	LAVATORIES			DRINKING FOUNTAINS	SERVICE SINK
	MALE	FEMALE	MALE	FEMALE	ALL GENDER	MALE	MALE	FEMALE	ALL GENDER		
A-3	170	170	2:101-200	4: 101-200	0	2: 101-200	1:1-200	2:101-200	0	2: 251-500	
REQUIRED PER CODE			2	4	-	2	2	3	-	2	1
TOTAL PROVIDED			-	-	9	-	-	-	8	4	1

OCCUPANCY TYPE	NO. OF OCCUPANTS		WATERCLOSETS			URINALS	LAVATORIES			DRINKING FOUNTAINS	SERVICE SINK
	MALE	FEMALE	MALE	FEMALE	ALL GENDER	MALE	MALE	FEMALE	ALL GENDER		
B	9	9	1: 1-50	1: 1-15	-	1:1-100	1:1-75	1: 1-50	-	1 : 150	
REQUIRED PER CODE			1	1	-	1	1	1	-	1	1
TOTAL PROVIDED			-	-	3*	-	-	-	2**	4***	1

1 * NO URINALS PROVIDED. ONE WC STAFF DESIGNATED & TWO WC'S PUBLIC DESIGNATED
** ONE LAV STAFF DESIGNATED & ONE LAV PUBLIC DESIGNATED
*** ALL ACCESSIBLE TO THE PUBLIC

PROJECT GENERAL NOTES

1. ALL PARTS OF THE WORK - INCLUDING MATERIALS, METHODS, ASSEMBLIES, ETC. - MUST COMPLY WITH THE MINIMUM REQUIREMENTS OF THE GOVERNING REGULATIONS OF ALL FEDERAL, STATE, DISTRICT AND LOCAL AUTHORITIES HAVING JURISDICTION OVER THE PROJECT AS WELL AS THOSE GREATER REQUIREMENTS INDICATED BY THE CONTRACT DOCUMENTS. NO PART OF THE CONTRACT DOCUMENTS MAY BE CONSTRUED TO REQUIRED OR PERMIT WORK CONTRARY TO A GOVERNING REGULATION.
2. CONSTRUCTION DOCUMENTS DESCRIBE THE PRODUCTS, SYSTEMS, QUANTITIES, CONFIGURATION, AND PERFORMANCE SPECIFICATIONS THAT DELIVER THE OVERALL DESIGN INTENT OF THE PROJECT.
3. THE CONSTRUCTION DOCUMENT DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY BOTH.
4. PERFORMANCE BY THE CONSTRUCTION TEAM SHALL BE CONSISTENT WITH THE CONSTRUCTION DRAWINGS AND SPECIFICATIONS AS NECESSARY TO DELIVER THE INDICATED RESULTS OF THE DESIGN INTENT.
5. THE TERM "OWNER", AS NOTED ON DRAWINGS AND AS SPECIFIED HEREIN, REFERS TO ALTADENA LIBRARY DISTRICT.
6. THE TERM "ARCHITECT", AS NOTED IN DRAWINGS, REFERS TO ANDERSON BRULE ARCHITECTS, INC.
7. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS SHALL ESTABLISH LOCATION OF ALL PARTITIONS, OPENINGS, EQUIPMENT, ETC.
8. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS WITH THOSE SHOWN ON THE DRAWINGS AND PROMPTLY REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO STARTING THE AFFECTED WORK.
9. THE ARCHITECTURAL DRAWINGS ARE A PART OF A LARGER SET OF DRAWINGS WHICH, WHEN COMPLETE, CONSISTS OF ALL DRAWINGS LISTED BY THE INDEX OF DRAWINGS. THE WORK DESCRIBED BY THE DRAWINGS OF ANY ONE DISCIPLINE MAY BE AFFECTED BY THE WORK DESCRIBED ON DRAWINGS OF ANOTHER DISCIPLINE AND MAY REQUIRE REFERENCE TO THE DRAWINGS OF ANOTHER DISCIPLINE. PARTIAL SETS OF DRAWINGS ARE INCOMPLETE AND SHOULD NOT BE DISTRIBUTED OR UTILIZED BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK OF ALL SUBCONTRACTORS, TRADES, AND SUPPLIERS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BEFORE COMMENCING CONSTRUCTION, AND TO ASSURE THAT ALL PARTIES ARE AWARE OF ALL REQUIREMENTS, REGARDLESS OF WHERE THE REQUIREMENTS OCCUR IN THE CONTRACT DOCUMENTS, WHICH MIGHT AFFECT THE WORK OF THAT PARTY.
10. AS PART OF THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK OF ALL SUBCONTRACTORS, TRADES, AND SUPPLIERS, THE CONTRACTOR SHALL ENDEAVOR TO IDENTIFY AND NOTIFY THE ARCHITECT OF ANY CONFLICTS BETWEEN THE WORK OF DIFFERENT PARTIES AT THE EARLIEST POSSIBLE DATE SO AS TO ALLOW A REASONABLE AND ADEQUATE TIME FOR THE CONFLICT TO BE RESOLVED WITHOUT DELAYING THE WORK. ALL DEVIATIONS FROM THAT WHICH IS REQUIRED BY THE CONTRACT DOCUMENTS MUST BE APPROVED IN ADVANCE BY THE ARCHITECT.
11. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL ASPECTS OF THE WORK AS SET FORTH IN THESE DRAWINGS AND SPECIFICATIONS.
12. WORK MUST COMPLY WITH "GEOTECHNICAL UPDATE REPORT, PROPOSED RENOVATION, MAIN LIBRARY, ALTADENA LIBRARY DISTRICT, 626 EAST MARIPOSA, ALTADENA CALIFORNIA.
13. PERMITS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROVAL AND PERMITS FOR ALL DESIGN/BUILD SYSTEMS, FOR EXAMPLE: FIRE SPRINKLERS AND UNDERGROUND FIRE LINES, AND VERIFY THAT THE SYSTEMS MEET ALL APPLICABLE CODE REQUIREMENTS.
14. MODIFICATIONS: ANY MODIFICATIONS TO THE BUILDING DESIGN RESULTING FROM FIELD CONDITIONS SHALL BE REPORTED TO THE ARCHITECT ALONG WITH ANY REQUIRED COSTS OR SAVINGS PRIOR TO CONSTRUCTION.
15. SHOP DRAWINGS: NEITHER THE ARCHITECT'S REVIEW NOR APPROVAL OF SHOP DRAWINGS SHALL RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR DEVIATIONS FROM DRAWINGS OR SPECIFICATIONS UNLESS HE/SHE HAS CALLED THE ARCHITECT'S ATTENTION (IN WRITING) TO SUCH DEVIATIONS AT THE TIME OF SUBMISSION, NOR SHALL IT RELIEVE HIM/HER OF RESPONSIBILITY FOR ERRORS OF ANY SORT IN THE SHOP DRAWINGS.
16. DIMENSIONS: THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB SITE PRIOR TO COMMENCING WORK AND SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT FOR RESOLUTION PRIOR TO THE START OF CONSTRUCTION.
17. MEANS AND METHODS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES AND PROCEDURES EMPLOYED IN THE PERFORMANCE OF WORK ON OR ABOUT THE JOB SITE. THE CONTRACTOR SHALL COORDINATE AND VERIFY ALL WORK PERFORMED BY SUBCONTRACTORS.
18. JOB SAFETY: THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE SAFETY CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, AND THE REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS THE OWNER AND THE ARCHITECT FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH PERFORMANCE OF WORK ON THIS PROJECT.
19. NECESSARY SUPPORTS: THE STRUCTURE IS DESIGNED AS A STABLE UNIT AFTER ALL COMPONENTS ARE IN PLACE. THE CONTRACTOR SHALL PROVIDE ALL SHORING AND BRACING NECESSARY TO ENSURE THE STABILITY OF ANY AND ALL PARTS OF THE BUILDING DURING CONSTRUCTION.
20. UTILITY CONNECTIONS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROVAL AND PERMIT FOR ALL UTILITY CONNECTION AND VERITY THAT THE CONNECTIONS MEET ALL APPLICABLE CODE REQUIREMENTS.
21. COORDINATION: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL ASPECTS OF THE WORK.
22. COORDINATION: IN THE EVENT CERTAIN FEATURES OF THE CONSTRUCTION ARE NOT FULLY SHOWN ON THE CONSTRUCTION DOCUMENTS, THEN THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AND QUALITY AS FOR SIMILAR CONDITIONS THAT ARE SHOWN AND ARE TO BE INCLUDED AS PART OF THE WORK.
23. ALL PRODUCTS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS, SPECIFICATIONS AND RECOMMENDATIONS.
24. ALL OPEN JOINTS, PENETRATIONS AND OTHER OPENINGS IN THE BUILDING ENVELOPE SHALL BE SEALED, CAULKED, GASKETED OR WEATHER STRIPPED TO LIMIT AIR LEAKAGE, AND PROVIDE A WEATHERTIGHT CONDITION.
25. GRADING SHALL MATCH EXISTING CONDITIONS AT LIMIT OF WORK EDGES.
26. ALL ITEMS SHOWN OR NOTED ARE NEW UNLESS SPECIFICALLY NOTED AS EXISTING.
27. PROVIDE FRAMING, BLOCKING, AND MOUNTING DEVICES AS REQUIRED FOR MOUNTING ALL EQUIPMENT, CASEWORK, ACCESSORIES, AND FIXTURES PROVIDED BY ALL TRADES INCLUDING MECHANICAL, PLUMBING, ELECTRICAL, LIGHTING, FIRE PROTECTION, ETC. COORDINATE WITH ALL TRADES TO DETERMINE ALL MOUNTING REQUIREMENTS.
28. ALL RATED CONSTRUCTION ASSEMBLIES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE REQUIREMENTS PUBLISHED BY THE LISTING AGENCY.
29. PROVIDE ISOLATION BETWEEN DISSIMILAR METALS AS REQUIRED TO PREVENT CORROSION CAUSED BY GALVANIC ACTION.
30. DETAILS AND NOTES LABELED "TYP." OR CALLED OUT AT, OR REFERRING TO, TYPICAL CONDITIONS, SHALL APPLY AT ALL OCCURRENCES OF SUCH CONDITIONS AND AT SIMILAR CONDITIONS WITH MODIFICATIONS THAT CAN BE REASONABLE INFERRED FROM THE DRAWINGS.
31. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE ALL CONSTRUCTION ACTIVITIES WILL NOT INTERFERE WITH EXISTING OVERHEAD AND UNDERGROUND UTILITIES WITHIN THE SITE AND WITHIN IMMEDIATE PROXIMITY TO THE SITE AND TO COORDINATE FULLY WITH ALL UTILITY COMPANIES.
32. WHERE ANY CONFLICT OCCURS BETWEEN THE REQUIREMENTS OF LAWS, CODES, ORDINANCES, RULES AND REGULATIONS, THE MOST STRINGENT SHALL GOVERN.
33. ENACT ALL MEASURES TO PROTECT AND SAFEGUARD ALL EXISTING ELEMENTS TO REMAIN FROM BEING DAMAGED. REPLACE OR REPAIR EXISTING ELEMENTS DAMAGED BY THE EXECUTION OF THIS CONTRACT TO EQUAL OR BETTER CONDITION.
34. CUTTING, BORING, SAWCUTTING OR DRILLING THROUGH THE EXISTING OR NEW STRUCTURAL ELEMENTS SHALL NOT TO BE STARTED UNTIL THE DETAILS HAVE BEEN REVIEWED AND APPROVED BY THE ARCHITECT, AND STRUCTURAL ENGINEER OF RECORD.
35. FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION WILL BE ENFORCED TO THE FULLEST EXTENT OF 2022 CBC, CFC CHAPTER 33 AND CFC CHAPTER 35.
36. ALL DIMENSIONS ARE SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES EXCEPT WHERE THE REQUIREMENT IS STATED AS A RANGE WITH SPECIFIC MINIMUM AND MAXIMUM END POINTS.
37. ANY ITEM IDENTIFIED TO BE DEMOLISHED, REMOVED, OR RELOCATED IS TO BE COMPLETELY REMOVED. INCLUDING BUT NOT LIMITED TO ANY CONCEALED ITEMS (PIPES, CURBS, FRAMING, BEAMS, FASTENERS, ETC.). ALL ITEMS WITHIN A DEMOLISHED AREA THAT MUST BE REROUTED IN ORDER TO MAINTAIN CONTINUITY SHALL BE DONE SO IN ACCORDANCE WITH APPROPRIATE SPECIFICATION SECTIONS IN THE PROJECT MANUAL AT NO ADDITIONAL COST. IF NO SPECIFICATION CAN BE FOUND WITHIN THE PROJECT MANUAL, THAN CONTINUITY SHALL BE MAINTAINED BY CURRENT STANDARD METHODS FOR CONSTRUCTION BUT NOT LESSER IN QUALITY THAN EXISTING. ANY AREA OF DEMOLITION OR REMOVAL SHALL BE LEFT IN A COMPLETELY FINISHED CONDITION AS OUTLINED IN THE PROJECT MANUAL.
38. ALIGN ALL FINISHES WITH EXISTING ADJACENT FINISHES. ON CONTINUOUS WALL SURFACES WHERE CONSTRUCTION INVOLVES MORE THAN ONE MATERIAL, FINISH, OR MATERIAL THICKNESS, ALIGN FACE OF FINISH UNLESS NOTED OTHERWISE.
1 39. CONSTRUCTION IN THE PUBLIC RIGHT OF WAY AND PROJECTION BEYOND THE PROPERTY LINES OR INTO THE ALLEYS SHALL COMPLY WITH COUNTY OF LOS ANGELES BUILDING CODE CHAPTER 32.
40. A. PEDESTRIANS SHALL BE PROTECTED DURING CONSTRUCTION, REMODELING AND DEMOLITION ACTIVITIES AS REQUIRED BY COUNTY OF LOS ANGELES BUILDING CODE CHAPTER 33.
B. THE CONSTRUCTION SHALL NOT RESTRICT A FIVE-FOOT CLEAR AND UNOBSTRUCTED ACCESS TO ANY WATER OR POWER DISTRIBUTION FACILITIES (POWER POLES, PULL-BOXES, TRANSFORMERS, VAULTS, PUMPS, VALVES, METERS, APPURTENANCES, ETC.) OR TO LOCATION OF THE HOOK-UP. THE CONSTRUCTION SHALL NOT BE WITHIN TEN FEET OF ANY POWER LINES WHETHER, OR NOT, THE LINES ARE LOCATED ON THE PROPERTY. FAILURE TO COMPLY MAY CAUSE CONSTRUCTION DELAYS AND/OR ADDITIONAL EXPENSES.
C. A COPY OF THE EVALUATION REPORT AND/OR EXISTING CONDITIONS SHALL BE MADE AVAILABLE AT THE JOB SITE.
2 41. PER ENERGY CODE SECTION 110.7 ALL JOINTS, PENETRATIONS, AND OTHER OPENING IN THE BUILDING ENVELOPE THAT ARE POTENTIAL SOURCES OF AIR LEAKAGE SHALL BE CAULKED, GASKETED, WEATHER-STRIPPED OR OTHERWISE SEALED TO LIMIT INFILTRATION AND EXFILTRATION.
3 42. THE PERSON WITH OVERALL RESPONSIBILITY FOR CONSTRUCTION OR THE PERSON RESPONSIBLE FOR THE INSTALLATION OF REGULATED FEATURES, MATERIALS, COMPONENTS, OR MANUFACTURED DEVICES SHALL POST, OR MAKE AVAILABLE WITH THE BUILDING PERMIT(S) ISSUED FOR THE BUILDING, THE REQUIRED INSTALLATION CERTIFICATE(S) FOR FEATURES, MATERIALS, COMPONENTS, OR MANUFACTURED DEVICES REGULATED BY THE APPLIANCE EFFICIENCY REGULATIONS OR PART 6. SUCH INSTALLATION CERTIFICATE(S) SHALL BE MADE AVAILABLE TO THE ENFORCEMENT AGENCY FOR ALL APPROPRIATE INSPECTIONS. THESE CERTIFICATES SHALL (SEC. 10-103(A,B)):
A. IDENTIFY FEATURES, MATERIALS, COMPONENTS, OR MANUFACTURED DEVICES REQUIRED TO VERIFY COMPLIANCE WITH THE APPLIANCE EFFICIENCY REGULATIONS AND PART 6.
B. INCLUDE A STATEMENT INDICATING THAT THE FEATURES, MATERIALS, COMPONENTS, OR MANUFACTURED DEVISE CONFORM TO THE APPLIANCE EFFICIENCY REGULATIONS AND PART 6 AND THE REQUIREMENTS FOR SUCH FEATURES, MATERIALS, COMPONENTS, OR MANUFACTURED DEVICES GIVEN IN THE PLANS AND SPECIFICATIONS APPROVED BY THE LOCAL ENFORCEMENT AGENCY.
C. STATE THE BUILDING PERMIT NUMBER UNDER WHICH THE CONSTRUCTION OR INSTALLATION WAS PERFORMED.

6/9/2025 6:01:36 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
RVaiera PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE TITLE 29
RVaiera PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	03/07/25	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

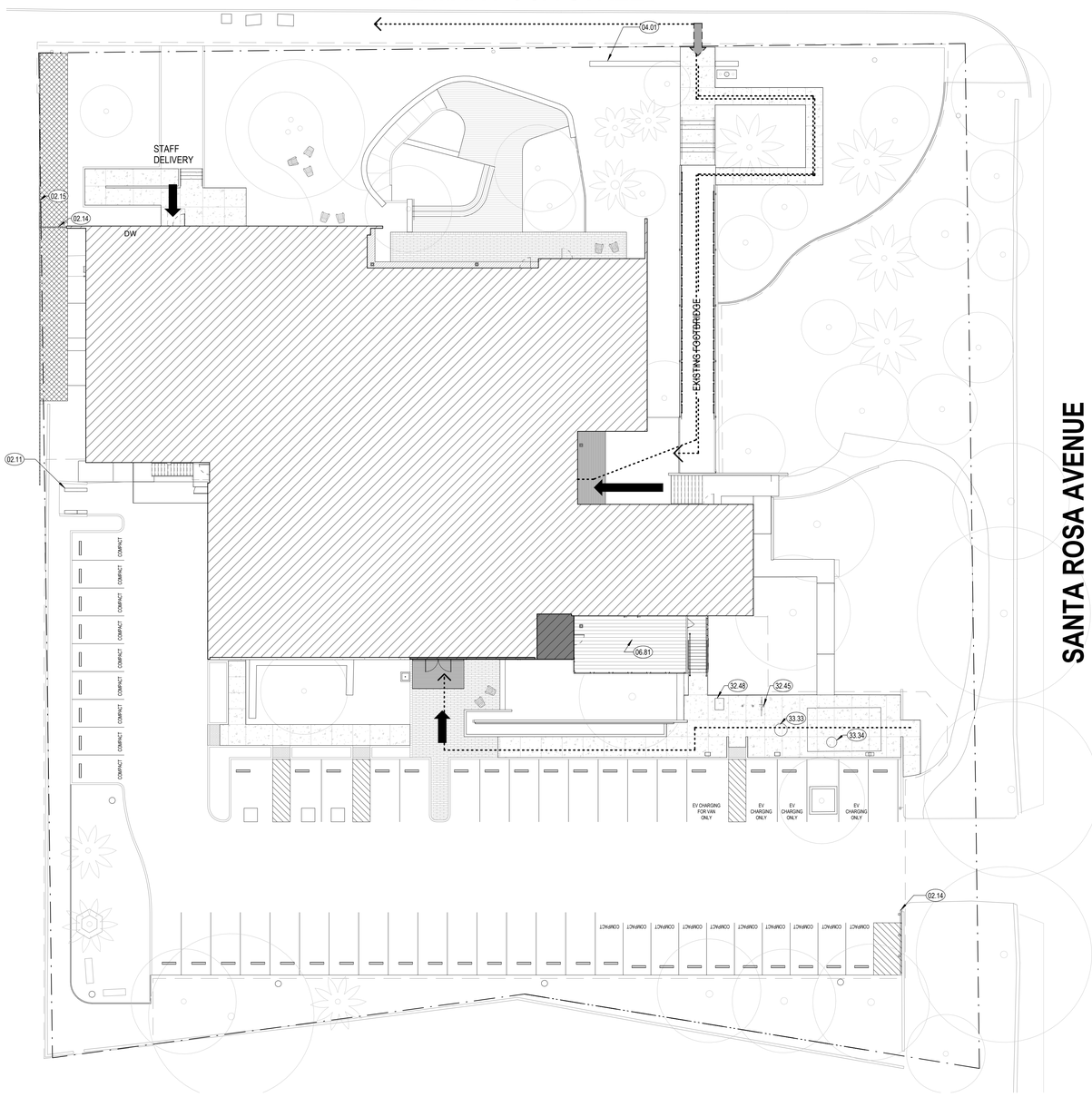
PROJECT NO. 2111010
DATE: 11-07-2024
SHEET TITLE:

CODE ANALYSIS & GENERAL NOTES

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

G001



1 PROPOSED SITE PLAN FOR CODE PLAN
1/16" = 1'-0"

KEYNOTES

02.14	(E) METAL GATE TO REMAIN
02.15	(E) CHAIN LINK FENCE TO REMAIN
04.01	ENTRY WALL AND SIGNAGE, S.L.D.

LEGEND

- PROPERTY LINE
- (E) BUILDING FOOTPRINT
- BUILDING ADDITION FOOTPRINT
- PATH, CHANGE IN LANDSCAPE OR HARDSCAPE
- STEPS/CHANGE IN LEVEL
- PARTIAL HEIGHT WALL
- PEDESTRIAN CONCRETE PAVING, SLD
- PRECAST CONCRETE PAVERS , SLD
- PRECAST CONCRETE PAVERS , SLD
- DECKING
- WALK OFF GRILLE
- (E) EASEMENT
- WHEEL STOP
- BUILDING ENTRY
- ACCESSIBLE PATH OF TRAVEL

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN 3/31/25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

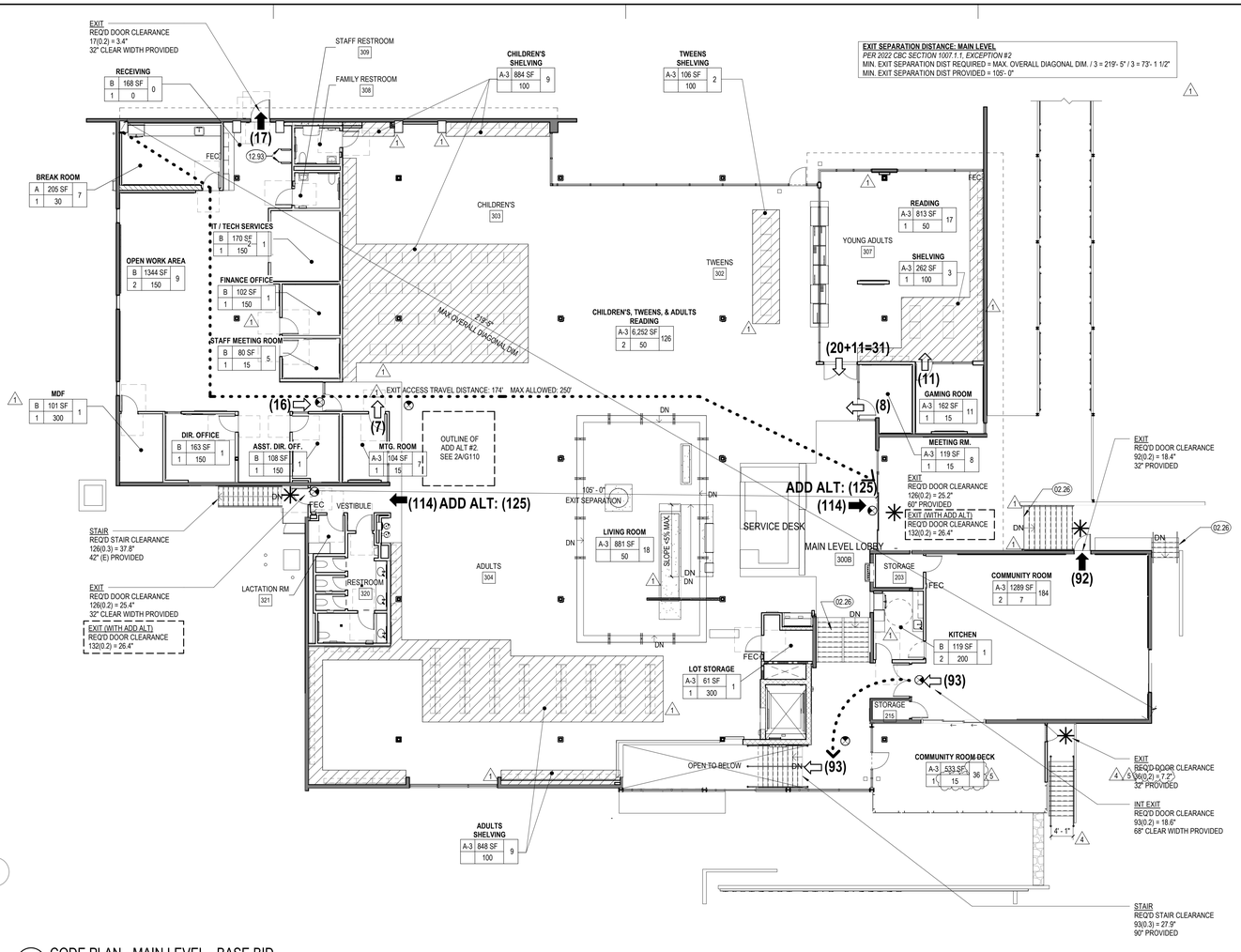
SITE CODE PLAN

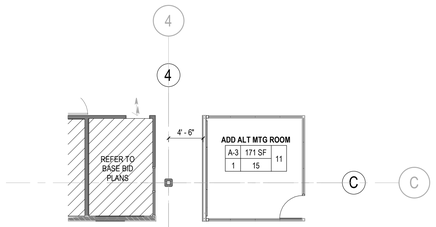
SCALE: 1/16" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

G100

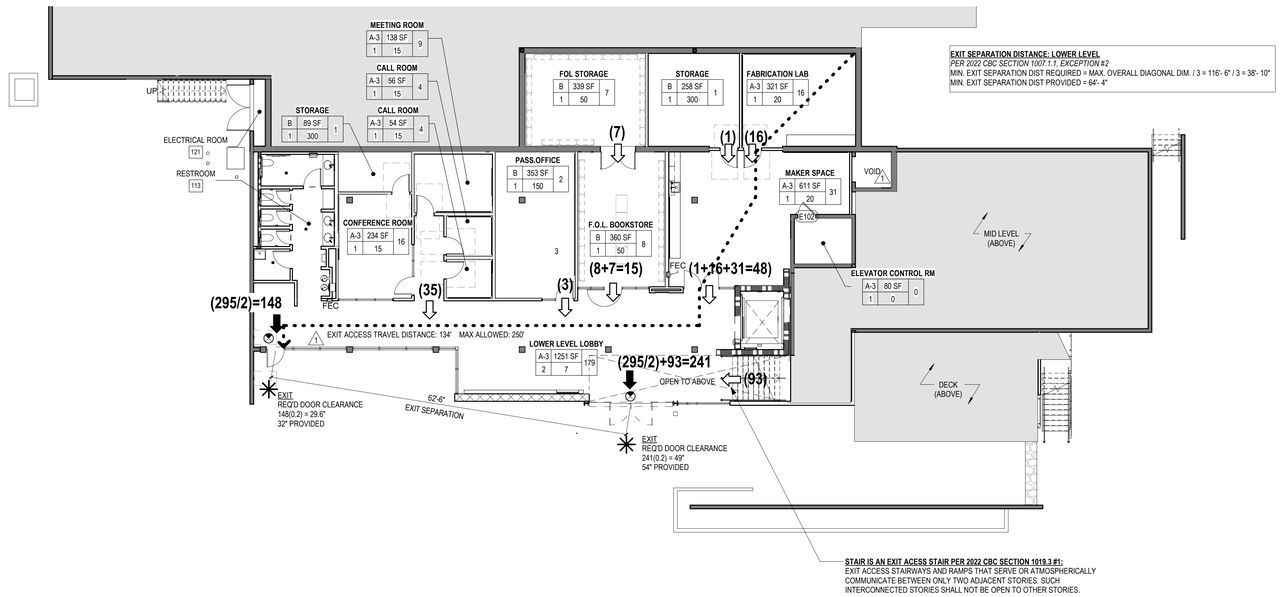
6/24/2024 6:34:08 PM





2A CODE PLAN - MAIN LEVEL - ADD ALT #2
1/8" = 1'-0"

2 CODE PLAN - MAIN LEVEL - BASE BID
3/32" = 1'-0"



1 CODE PLAN - LOWER LEVEL - BASE BID
3/32" = 1'-0"

CODE PLAN SHEET NOTES

A. SEE SHEET A800 FOR WALL TYPES
B. ALL GLAZING ASSEMBLIES IN FIRE RATED PARTITIONS TO BE RATED AS REQUIRED TO MAINTAIN RATING OF PARTITION.

CODE PLAN KEYNOTES

02.26 (E) STAIRS AND HANDRAIL TO REMAIN PER ACCESSIBILITY UPGRADE EXCEPTIONS CA BUILDING CODE 11N-207.1 (EXCEPTION 3), 11B-210.1 (EXCEPTION 2), AND 11B-505.10 (EXCEPTION 3)
12.93 SURFACE MOUNTED BICYCLE RACK.

CODE PLAN LEGEND

- SHELVING
- EGRESS PATH OF TRAVEL FROM PROJECT AREA
- OCCUPANT LOAD EXITING THROUGH AN EXIT OR EXIT ACCESS DOORWAY
- OCCUPANT LOAD EXITING THROUGH INTERMEDIATE SPACES
- (##) OCCUPANT LOAD
- STAFF WORKROOM / B 938 SF / 1 100 XXX — # OF OCCUPANTS; OCCUPANCY LOAD FACTOR; MINIMUM NUMBER OF REQUIRED EXITS; OCCUPANCY GROUP
- EXIT SIGNAGE; SEE ELECTRICAL DRAWINGS
- FEC — FIRE EXTINGUISHER CABINET
- EXIT DISCHARGE
- 1 HOUR MIN. RATED FIRE BARRIER

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #3 FIRE ENGINEERING SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
4	06/13/2025	FIRE PLAN BACKCHECK
5	07/16/2025	FIRE PLAN BACKCHECK #3

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

CODE PLAN

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

G110

7/16/2025 2:17:43 PM

AIA California 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y | N/A | RESPON. PARTY

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.3 NONRESIDENTIAL ADDITIONS AND ALTERATIONS. [BSC-CG] The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of $200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and/or alterations [A]. When the code section applies to both, no banner will be used.

301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:

Note: On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 *et seq.* for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.

301.3.2 Waste Diversion. The requirements of Section 5.408 shall be required for additions and alterations whenever a permit is required for work.

301.4 PUBLIC SCHOOLS AND COMMUNITY COLLEGES. (see GBSC)
301.5 HEALTH FACILITIES. (see GBSC)

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

SECTION 303 PHASED PROJECTS

303.1 PHASED PROJECTS. For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

303.1.1 Initial Tenant improvements. The provisions of this code shall apply only to the initial tenant improvements to a project. Subsequent tenant improvements shall comply with the scoping provisions in Section 301.3 non-residential additions and alterations.

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES
DIVISION 5.1 PLANNING AND DESIGN
SECTION 5.101 GENERAL

5.101.1 SCOPE
The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION 5.102 DEFINITIONS

5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

CUTOFF LUMINAIRES. Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.
Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), enhanced advanced technology PZEV (enhanced AT ZEV) or transitional zero emission vehicles (TZEV) regulated under CCR, Title 13, Section 1962.
2. High-efficiency vehicles, regulated by U.S. EPA, bearing a fuel economy and greenhouse gas rating of 9 oe 10 as regulated under 40 CFR Section 600 Subpart D.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV). A motor vehicle that meets the definition of "low-speed vehicle" either in Section 385.5 of the Vehicle Code or in 49CFR571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

TENANT-OCCUPANTS. Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

VANPOOL VEHICLE. Eligible vehicles are limited to any motor vehicle, other than a motortruck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purpose of ridesharing.

Note: Source: Vehicle Code, Division 1, Section 668

ZEV. Any vehicle certified to zero-emission standards.

SECTION 5.106 SITE DEVELOPMENT

Y | N/A | RESPON. PARTY

5.106.1 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB LESS THAN ONE ACRE OF LAND. Newly constructed projects and additions which disturb less than one acre of land, and are not part of a larger common plan of development or sale, shall prevent the pollution of storm water runoff from the construction activities through one or more of the following measures:

☒ | ☐ | GC
SEE CIVIL SHEETS C-3.1, C-4.1, C-6.2, C-6.3

5.106.1.1 Local ordinance. Comply with a lawfully enacted storm water management and/or erosion control ordinance.

5.106.1.2 Best Management Practices (BMPs). Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMPs.

1. Soil loss BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Scheduling construction activity during dry weather, when possible.
   b. Preservation of natural features, vegetation, soil, and buffers around surface waters.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils.
   e. Erosion control to protect slopes.
   f. Protection of storm drain inlets (gravel bags or catch basin inserts).
   g. Perimeter sediment control (perimeter silt fence, fiber rolls).
   h. Sediment trap or sediment basin to retain sediment on site.
   i. Stabilized construction exits.
   j. Wind erosion control.
   k. Other soil loss BMPs acceptable to the enforcing agency.
2. Good housekeeping BMPs to manage construction equipment, materials, non-stormwater discharges and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Dewatering activities.
   b. Material handling and waste management.
   c. Building materials stockpile management.
   d. Management of washout areas (concrete, paints, stucco, etc.).
   e. Control of vehicle/equipment fueling to contractor's staging area.
   f. Vehicle and equipment cleaning performed off site.
   g Spill prevention and control.
   h. Other housekeeping BMPs acceptable to the enforcing agency.

Y | N/A | RESPON. PARTY

☐ | ☒

5.106.2 STORMWATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB ONE OR MORE ACRES OF LAND. Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development sale.

Note: Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of the larger common plan of development or sale must comply with the post-construction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).

The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conversation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency.

Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

☐ | ☒

5.106.4 BICYCLE PARKING. For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2

5.106.4.1 Bicycle parking. [BSC-CG] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

5.106.4.1.1 Short-term bicycle parking. If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.
Exception: Additions or alterations which add nine or less visitor vehicular parking spaces.

5.106.4.1.2 Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.3 For additions or alterations that add 10 or more tenant-occupant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility.

5.106.4.1.4 For new shell buildings in phased projects provide secure bicycle parking for 5 percent of the anticipated tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.5 Acceptable bicycle parking facility for Sections 5.106.4.1.2, 5.106.4.1.3, and 5.106.4.1.4 shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

5.106.4.2 Bicycle parking. [DSA-SS] For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2

5.106.4.2.1 Student bicycle parking. Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building.
5.106.4.2.2 Staff bicycle parking. Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

☐ | ☒

5.106.5.3 Electric vehicle (EV) charging. [N] Construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3.1 and shall be provided in accordance with regulations in the California Building Code and the California Electrical Code.

Exceptions:
1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcement agency substantiating the local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.
2. Parking spaces accessible only by automated mechanical car parking systems are not required to comply with this code section

5.106.5.3.1 EV capable spaces.
[N] EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements:
1. Raceways complying with the California Electrical Code and no less that 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the EV capable and into a suitable listed cabinet, box,enclosure or equivalent. A common raceway may be used to serve multiple EV charging spaces.
2. A service panel or subpanel (s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.
4. The service panel or subpanel circuit directory shall identify the reserved overcurrent protective devices space(s) as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."

Note: A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by an enforcement agency. See vehicle Code Section 22511.2 for further details.

TABLE 5.106.5.3.1

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE)^2
0-9	0	0
10-25	2	0
26-50	8	2
51-75	13	3
76-100	17	4
101-150	25	6
151-200	35	9
201 AND OVER	20% of total[1]	25% of EV capable spaces[1]

1. Where there is insufficient electrical supply.
2. The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count towards the total number of required EV capable spaces shown in column 2.

5.106.5.3.2 Electric vehicle charging stations (EVCS)
EV capable spaces shall be provided with EVSE to create EVCS in the number indicated in Table 5.106.5.3.1. The EVCS required by Table 5.106.5.3.1 may be provided with EVSE in any combination of Level 2 and Direct Current Fast Charging (DCFC), except that at least one Level 2 EVSE shall be provided.

One EV charger with multiple connectors capable of charging multiple EVs simultaneously shall be permitted if the electrical load capacity required by Section 5.106.5.3.1 for each EV capable space is accumulatively supplied to the EV charger.

The installation of each DCFC EVSE shall be permitted to reduce the minimum number of required EV capable spaces without EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.

Y | N/A | RESPON. PARTY

☐ | ☒

5.106.5.3.3 Use of automatic load management systems (ALMS).
ALMS shall be permitted for EVCS. When ALMS is installed, the required electrical load capacity specified in Section 5.106.5.3.1 for each EVCS may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs.

5.106.5.3.4 Accessible EVCS.
When EVSE is installed, accessible EVSC shall be provided in accordance with the *California Building Code*, Chapter 11B, Section 11B-228.3.
Note: For EVCS signs, refer to Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

5.106.5.4 Electric Vehicle (EV) charging: medium-duty and heavy-duty. [N]
Construction shall comply with section 5.106.5.4.1 to facilitate future installation of electric vehicle supply equipment (EVSE). Construction for warehouses, grocery stores and retail stores with planned off-street loading spaces shall also comply with Section 5.106.5.4.1 for future installation of medium- and heavy-duty EVSE.
Exceptions:
1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply.
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the *California Electrical Code* and as follows:

5.106.5.4.1 Electric vehicle charging readiness requirements for warehouse, grocery stores and retail stores with planned off-street loading spaces.
[N] In order to avoid future demolition when adding EV charging supply and distribution equipment, spare raceways(s) or busway(s) and adequate capacity for transformers(s), service panels(s) or subpanel(s) shall be installed at the time of construction in accordance with the California Electrical Code. Construction plans and specifications shall include but are not limited to, the following:
1. The transformer, main service equipment and subpanel shall meet the minimum power requirement in Table 5.106.5.4.1 to accommodate the dedicated branch circuits for the future installation of EVSE.
2. The construction documents shall indicate on or more location(s) convenient to the planned offstreet loading space(s) reserved for medium-and heavy-duty ZEV charging cabinets and charging dispensers, and a pathway reserved for routing of conduit from the termination of the raceway(s) or busway(s) to the charging cabinet(s) and dispenser(s) as shown in Table 5.106.5.4.1
3. Raceway(s) or busway(s) originating at a main service panel or a subpanel(s) serving the area where potential future medium-and heavy-duty EVSE will be located and shall terminate in close proximity to the potential future location of the charging equipments for medium- and heavy-duty vehicles.
4. The raceway(s) or busway(s) shall be sufficient size to carry the minimum additional system load to the future location of the charging for medium- and heavy-duty ZEVs as shown in Table 5.106.5.4.1.

TABLE 5.106.5.4.1 RACEWAY CONDUIT AND PANEL POWER REQUIREMENTS FOR MEDIUM- AND HEAVY-DUTY EVSE [N]

BUILDING TYPE	BUILDING SIZE (SQ. FT.)	NUMBER OF OFF-STREET LOADING SPACES	ADDITIONAL CAPACITY REQUIRED (KVA) FOR RACEWAY & BUSWAY AND TRANSFORMER & PANEL
Grocery	10,000 to 90,000	1 or 2	200
		3 or Greater	400
	Greater than 90,000	1 or Greater	400
Retail	10,000 to 135,000	1 or 2	200
		3 or Greater	400
	Greater than 135,000	1 or Greater	400
Warehouse	20,000 to 256,000	1 or 2	200
		3 or Greater	400
	Greater than 256,000	1 or Greater	400

5.106.8 LIGHT POLLUTION REDUCTION. [N]. I Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the California Energy Code for Lighting Zones 0-4 as defined in Chapter 10, Section 10-114 of the California Administrative Code; and
2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in Chapter 8);
3. Uplight and Glare ratings as defined in California Energy Code (shown in Tables 130.2-A and 130.2-B in Chapter 8) and
4. Allowable BUG ratings not exceeding those shown in Table 5.106.8, [N] or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

Exceptions: [N]

1. Luminaires that qualify as exceptions in Sections 130.2 (b) and 140.7 of the California Energy Code.
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.
5. Luminaires with less than 6,200 initial luminaire lumens.

TABLE 5.106.8 [N] MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
MAXIMUM ALLOWABLE BACKLIGHT RATING [3]					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1-2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5-1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
MAXIMUM ALLOWABLE UPLIGHT RATING (U)					
For area lighting [3]	N/A	U0	U0	U0	U0
For all other outdoor lighting,including decorative luminaires	N/A	U1	U2	U3	UR
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**					
	N/A	G1	G2	G3	G4
	N/A	G0	G1	G1	G2
	N/A	G0	G0	G1	G1
	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.

2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.

3. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaries located in these areas shall meet *U*-value limits for "all other outdoor lighting"

5.106.8.1 Facing- Backlight
Luminaries within 2MH of a property line shall be oriented so that the nearest property line is behind the fixture, and shall comply with the backlight rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point of that property line.
Exception: Corners. If two property lines (or two segments of the same property line) have equidistant point to the luminaire, then the luminaire may be oriented so that the intersection of the two lines (the corner) is directly behind the luminaire. The luminaire shall still use the distance to the nearest points(s) on the property lines to determine the required backlight rating.

5.106.8.2 Facing-Glare.
For luminaires covered by 5.106.8.1, if a property line also exists within or extends into the front hemisphere within 2MH of the luminaire then the luminaire shall comply with the more stringent glare rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point on the nearest property line within the front hemisphere.

Note: [N]
1.See also *California Building Code*, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.
2.Refer to Chapter 8 (Compliance Forms, Worksheets and Reference Material) for IES TM-15-11 Table A-1, *California Energy Code* Tables 130.2-A and 130.2-B.
3. Refer to the *California Building Code* for requirements for additions and alterations.

5.106.10 GRADING AND PAVING. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales.
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.
   Exception: Additions and alterations not altering the drainage path.

5.106.12 SHADE TREES [DSA-SS]. Shade Trees shall be planted to comply with Sections 5.106.12.1, 5.106.12.2, and 5.106.12.3. Percentages shown shall be measured at noon on the summer solstice. Landscape irrigation necessary to establish and maintain tree health shall comply with Section 5.304.6.

5.106.12.1 Surface parking areas. Shade tree plantings, minimum #10 container size or equal, shall be installed to provide shade over 50 percent of the parking area within 15 years.

Exceptions: Surface parking area covered by solar photovoltaic shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5 shall be permitted in whole or in part in lieu of shade tree planting.

5.106.12.2 Landscape areas. Shade tress plantings, minimum #10 container size or equal shall be installed to provide shade of 20% of the landscape area within 15 years.

Exceptions: Playfields for organized sport activity are not included in the total area calculation.

5.106.12.3. Hardscape areas. Shade tree plantings, minimum #10 container size or equal shall be installed to provide shade over 20 percent of the hardscape area within 15 years.

Exceptions:
1. Walks, hardscape areas covered by solar photovoltaic shade structures or shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5 shall be permitted in whole or in part in lieu of shade tree planting.
2. Designated and marked play areas of organized sport activity are not included in the total area calculation.

Y | N/A | RESPON. PARTY

☒ | ☐ | CIVIL
SEE CIVIL SHEETS

☐ | ☒

DIVISION 5.2 ENERGY EFFICIENCY
SECTION 5.201 GENERAL

5.201.1 Scope [BSC-CG]. ***California Energy Code [DSA-SS].*** For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

DIVISION 5.3 WATER EFFICIENCY AND CONSERVATION
SECTION 5.301 GENERAL

5.301.1 Scope. The provisions of this chapter shall establish the means of conserving water use indoors, outdoors and in wastewater conveyance.

SECTION 5.302 DEFINITIONS

5.302.1 Definitions. The following terms are defined in Chapter 2 *(and are included here for reference)*

EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) [DSA-SS]. An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency, which ae two major influences on the amount of water that needs to be applied to the landscape.

FOOTPRINT AREA [DSA-SS]. The total area of the furthest exterior wall of the structure projected to natural grade, not including exterior areas such as stairs, covered walkways, patios and decks.

METERING FAUCET. A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

GRAYWATER. Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines and laundry tubs, but does not include waste water from kitchen sinks or dishwashers.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area and climatological parameters.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). [HCD] The California model ordinance (California Code of Regulations, Title 23, Division 2, Chapter 2.7), regulating landscape design, installation and maintenance practices. Local agencies are required to adopt the updated MWELO, or adopt a local ordinance at least as effective as the MWELO.

POTABLE WATER. Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the California Plumbing Code, Part 5.

POTABLE WATER. [HCD] Water that is satisfactory for drinking, culinary, and domestic purposes, and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards and the requirements of the Health Authority Having Jurisdiction.

RECYCLED WATER. Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur [Water Code Section 13050 (n)]. Simply put, recycled water is water treated to remove waste matter attaining a quality that is suitable to use the water again.

SUBMETER. [HCD 1] A secondary device beyond a meter that measures water consumption of an individual rental unit within a multiunit residential structure or mixed-use residential and commercial structure. (See Civic Code Section 1954.202 (g) and Water code Section 517 for additional details.)

WATER BUDGET. Is the estimated total landscape irrigation water use which shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Efficient Landscape Ordinance (MWELO).

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT MARK SCHOEMAN No. C-19562 REN 3/31/25 STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 06-24-2024
SHEET TITLE:

CALGREEN

SCALE:

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

G120

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

6/24/2024 5:34:15 PM

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 2 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY

SECTION 5.303 INDOOR WATER USE

5.303.1 METERS. Separate submeters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

5.303.1.1 Buildings in excess of 50,000 square feet. Separate submeters shall be installed as follows:

1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot water boilers with energy input more than 500,000 Btu/h (147 kW).

5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

Y	N/A	RESPON. PARTY
X		
X		PLUMBING
X		PLUMBING

SEE PLUMBING SHEET P002

5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

5.303.3.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

5.303.3.2 Urinals.

5.303.3.2.1 Wall-mounted Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush.

5.303.3.2.2 Floor-mounted Urinals. The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush.

Y	N/A	RESPON. PARTY
X		

5.303.3 Showerheads. [BSC-CG]

5.303.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.
Note: A hand-held shower shall be considered a showerhead.

Y	N/A	RESPON. PARTY
X		PLUMBING

SEE PLUMBING SHEET P002

5.303.3.4 Faucets and fountains.

5.303.3.4.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.

5.303.3.4.2 Kitchen faucets. Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

5.303.3.4.3 Wash fountains. Wash fountains shall have a maximum flow rate of not more than1.8 gallons per minute/20 [rim space (inches) at 60 psi].

5.303.3.4.4 Metering faucets. Metering faucets shall not deliver more than 0.20 gallons per cycle.

5.303.3.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per minute/20 [rim space (inches) at 60 psi].

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

5.303.3.4.6 Pre-rinse spray value
When installed, shall meet the requirements in the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations), Section 1605.1 (h)(4) Table H-2, Section 1605.3 (h)(4)(A), and Section 1607 (d)(7), and shall be equipped with an integral automatic shutoff.

FOR REFERENCE ONLY: The following table and code section have been reprinted from the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations), Section 1605.1 (h)(4) and Section 1605.3 (h)(4)(A).

TABLE H-2

STANDARDS FOR COMMERCIAL PRE-RINSE SPRAY VALUES MANUFACTURED ON OR AFTER JANUARY 28, 2019

PRODUCT CLASS [spray force in ounce force (ozf)]	MAXIMUM FLOW RATE (gpm)
Product Class 1 (≤ 5.0 ozf)	1.00
Product Class 2 (> 5.0 ozf and ≤ 8.0 ozf)	1.20
Product Class 3 (> 8.0 ozf)	1.28

Y	N/A	RESPON. PARTY
X		

5.303.4 COMMERCIAL KITCHEN EQUIPMENT.

5.303.4.1 Food Waste Disposers. Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.
Note: This code section does not affect local jurisdiction authority to prohibit or require disposer installation.

5.303.5 AREAS OF ADDITION OR ALTERATION. For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

5.303.6 STANDARDS FOR PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* and in Chapter 6 of this code.

SECTION 5.304 OUTDOOR WATER USE

Y	N/A	RESPON. PARTY
X		LANDSCAPE

SEE LANDSCAPE SHEET L200

5.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

Notes:
1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the California Code of Regulations, Title 23, Chapter 2.7, Division 2.
2. MWELO and supporting documents, including a water budget calculator, are available at: https://www.water.ca.gov/.

Y	N/A	RESPON. PARTY
X		

5.304.6 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. For public schools and community colleges, landscape projects as described in Sections 5.304.6.1 and 5.304.6.2 shall comply with the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, *California Code of Regulations*, except that the evapotranspiration adjustment factor (ETAF) shall be 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of the MWELO.

5.304.6.1 Newly constructed landscapes. New construction projects with an aggregate landscape area equal to or greater than 500 square feet.

5.304.6.2 Rehabilitated landscapes. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.401 GENERAL

5.401.1 SCOPE. The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through protection of buildings from exterior moisture, construction waste diversion, employment of techniques to reduce pollution through recycling of materials, and building commissioning or testing and adjusting.

Y	N/A	RESPON. PARTY
X		ARCHITECT & LANDSCAPE

5.407.2 MOISTURE CONTROL. Employ moisture control measures by the following methods.

5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent spray on structures.

5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

1. An installed awning at least 4 feet in depth.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.

SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

Y	N/A	RESPON. PARTY
X		GC

SEE SPECS

5.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan that:

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

5.408.1.2 Waste Management Company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

Note: The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.

5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65% minimum requirement as approved by the enforcing agency.

5.408.1.4 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1, through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

Notes:

1. Sample forms found in "A Guide to the California Green Building Standards Code (Nonresidential)" located www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

Y	N/A	RESPON. PARTY
X		GC

SEE SPECS

5.408.2 UNIVERSAL WASTE. [A] Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

Note: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/universalwaste/

5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

Exception: Reuse, either on or off-site, of vegetation or soil contaminated by disease or pest infestation.

Notes:

1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material.
2. For a map of know pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (www.cdfa.ca.gov)

Y	N/A	RESPON. PARTY
X		

SECTION 5.410 BUILDING MAINTENANCE AND OPERATIONS

5.410.1 RECYCLING BY OCCUPANTS. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Exception: Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.

5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30% or more in floor area, shall provide recycling areas on site.

Exception: Additions within a tenant space resulting in less than a 30% increase in the tenant space floor area.

5.410.1.2 Sample ordinance. Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the *Public Resources Code*. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

Note: A sample ordinance for use by local agencies may be found in Appendix A of the document at the CalRecycle's web site.

Y	N/A	RESPON. PARTY
X		

5.410.2 COMMISSIONING. [N] New buildings 10,000 square feet and over. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated y the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements

Commissioning requirements shall include:

1. Owner's or Owner representative's project requirements.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

Note: For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and or air conditioning.

Informational Notes:

1. IAS AC 476 is an accreditation criteria for organizations providing training and/or certification of commissioning personnel. AC 476 is available to the Authority Having Jurisdiction as a reference for qualifications of commissioning personnel. AC 476 des not certify individuals to conduct functional performance tests or to adjust and balance systems.

2. Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

5.410.2.1 Owner's or Owner Representative's Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:
1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse system.

5.410.2.3 Commissioning plan. [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:
1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
   a. An explanation of the original design intent.
   b. Equipment and systems to be tested, including the extent of tests.
   c. Functions to be tested.
   d. Conditions under which the test shall be performed.
   e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

5.410.2.4 Functional performance testing. [N] Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

5.410.2.5 Documentation and training. [N] A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in *California Code of Regulations* (CCR), Title 8, Section 5142, and other related regulations.

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:
1. Site information, including facility description, history and current requirements.
2. Site contact information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
4. Major systems.
5. Site equipment inventory and maintenance notes.
6. A copy of verifications required by the enforcing agency or this code.
7. Other resources and documentation, if applicable.

5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:
1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the Systems Manual.
4. Review of the record drawings on the system/equipment.

5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

Y	N/A	RESPON. PARTY
X		MECH

SEE SPECS

5.410.4 TESTING AND ADJUSTING. New buildings less than 10,000 square feet. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

5.410.4.2 (Reserved)

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting system and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements and Sections 120.5, 120.6, 130.4, and 140.9(b)3 for additional testing requirements of specific systems.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

Y	N/A	RESPON. PARTY

5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 Operation and maintenance (O & M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.

DIVISION 5.5 ENVIRONMENTAL QUALITY

SECTION 5.501 GENERAL

5.501.1 SCOPE. The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

SECTION 5.502 DEFINITIONS

5.502.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ARTERIAL HIGHWAY. A general term denoting a highway primarily for through traffic usually on a continuous route.

A-WEIGHTED SOUND LEVEL (dBA). The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

1 BTU/HOUR. British thermal units per hour, also referred to as Btu. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate. A ton of refrigeration is 12,000 Btu, the amount of heat required to melt a ton (2,000 pounds) of ice at 32^{0} Fahrenheit.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL). A metric similar to the day-night average sound level (Ldn), except that a 5 decibel adjustment is added to the equivalent continuous sound exposure level for evening hours (7pm to 10pm) in addition to the 10 dB nighttime adjustment used in the Ldn.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, timber, prefabricated wood I–joists or finger–jointed lumber, all as specified in California Code of Regulations (CCR), Title 17, Section 93120.1(a).

Note: See CCR, Title 17, Section 93120.1.

DAY-NIGHT AVERAGE SOUND LEVEL (Ldn). The A-weighted equivalent continuous sound exposure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10p.m. to 7 a.m.).

DECIBEL (db). A measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the *California Electrical Code*, off-road, self-propoelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.

ELECTRIC VEHICLE CHARGING STATION(S) (EVCS)). One or more spaces intended for charging electric vehicles.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

ENERGY EQUIVALENT (NOISE) LEVEL (Leq). The level of a steady noise which would have the same energy as the fluctuating noise level integrated over the time of period of interest.

EXPRESSWAY. An arterial highway for through traffic which may have partial control of access, but which may or may not be divided or have grade separations at intersections.

FREEWAY. A divided arterial highway with full control of access and with grade separations at intersections.

GLOBAL WARMING POTENTIAL (GWP). The radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time. Carbon dioxide is the reference compound with a GWP of one.

GLOBAL WARMING POTENTIAL VALUE (GWP VALUE). A 100-year GWP value published by the Intergovernmental Panel on Climate Change (IPCC) in either its Second Assessment Report (SAR) (IPCC, 1995); or its Fourth Assessment A-3 Report (AR4) (IPCC, 2007). The SAR GWP values are found in column "SAR (100-yr)" of Table 2.14.; the AR4 GWP values are found in column "100 yr" of Table 2.14.

HIGH-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that is: (a) a chlorofluorocarbon, a hdrochlorofluorocarbon, a hydrofluorocarbon, a perfluorocarbon, or any compound or blend of compounds, with a GWP value equal to or greater than 150, or (B) any ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

LONG RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.5 times the pipe diameter.

LOW-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that: (A) has a GWP value less than 150, and (B) is not an ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

MERV. Filter minimum efficiency reporting value, based on ASHRAE 52.2–1999.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base REactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundreths of a gram (g O^{3}/g ROC).

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

PSIG. Pounds per square inch, guage.

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

SCHRADER ACCESS VALVES. Access fittings with a valve core installed.

SHORT RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.0 times the pipe diameter.

SUPERMARKET. For the purposes of Section 5.508.2, a supermarket is any retail food facility with 8,000 square feet or more conditioned area, and that utilizes either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units.

VOC. A volatile organic compound broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a)

Note: Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

SECTION 5.503 FIREPLACES

Y	N/A	RESPON. PARTY
X		

5.503.1 FIREPLACES. Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

5.503.1.1 Woodstoves. Woodstoves and pellet stoves shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits.

SECTION 5.504 POLLUTANT CONTROL

Y	N/A	RESPON. PARTY
X		GC

SEE SPECS

5.504.1 TEMPORARY VENTILATION. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992 Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

Y	N/A	RESPON. PARTY
X		GC

SEE SPECS

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilation equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

6/24/2024 6:34:18 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

REGISTERED ARCHITECT MARK SCHOEMAN No. C-19562 REN 3/31/25 STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

CALGREEN

SCALE:

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

G121

AIA California 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

NONRESIDENTIAL MANDATORY MEASURES, SHEET 3 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY
☒	☐	GC

SEE SPECS

5.504.4 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT[1,2]

Less Water and Less Exempt Compounds in Grams per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT SPECIFICALLY LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF

TABLE 5.504.4.2 - SEALANT VOC LIMIT

Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NONPOROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

NOTE: FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THESE TABLES, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

5.504.4.3.1 Aerosol Paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

Y	N/A	RESPON. PARTY

TABLE 5.504.4.3 - CONT.

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	CURRENT VOC LIMIT
SPECIALTY COATINGS	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH-TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS:	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification
2. Field verification of on-site product containers

5.504.4.4 Carpet Systems.
All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Version 1.2, January 2017 (Emission testing method for California Specifications 01350).

See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the California Department of Public Health,"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,"Version 1.2, January 2017 (Emission testing method for California Specifications 01350).

See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1.

5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure (ATCM) for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

5.504.4.5.3 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

TABLE 5.504.4.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16 INCHES (8 MM).

Y	N/A	RESPON. PARTY
☐	☒	

5.504.4.6 Resilient flooring systems. Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall meet the requirements of the California Department of Public Health,"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specifications 01350)

See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.6.1 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

5.504.4.7 Thermal insulation
Comply with the requirements of the California Department of Public Health, "Standard Method of the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, "Version 1.2, January 1.2, January 2017 (Emission testing method for California Specification 01350).
See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.7.1 Verification of compliance.
Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.

5.504.4.8 Acoustical ceiling and wall panels.
Comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, " Version 1.2, January 2017 (Emission testing method for California Specification 01350).
See California Department of Public Health's website for certification programs and testing labs.

5.504.4.8.1 Verification of compliance. Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.

5.504.5.3 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

Exceptions: Existing mechanical equipment.

5.504.5.3.1 Labeling. Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

Y	N/A	RESPON. PARTY
☐	☒	

5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL. Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University, or campus of the University of California, whichever are more stringent. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

SECTION 5.505 INDOOR MOISTURE CONTROL

5.505.1 INDOOR MOISTURE CONTROL. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2 of this code.

Y	N/A	RESPON. PARTY
☒	☐	MECH

SEE SPECS

SECTION 5.506 INDOOR AIR QUALITY

5.506.1 OUTSIDE AIR DELIVERY. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the *California Energy Code*, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

Y	N/A	RESPON. PARTY
☒	☐	MECH

SEE SPECS

5.506.2 CARBON DIOXIDE (CO_2) MONITORING. For buildings or additions equipped with demand control ventilation, CO_2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120(c)(4).

Y	N/A	RESPON. PARTY
☐	☒	

5.506.3 Carbon dioxide (CO2) monitoring in classrooms.
(DSA-SS) Each public K-12 school classroom, as listed in Table 120.1-A of the *California Energy Code*, shall be equipped with a carbon dioxide monitor or sensor that meets the following requirements:

1. The monitor or sensor shall be permanently affixed in a tamper-proof manner in each classroom between 3 and 6 feet (914 mm and 1829 mm) above the floor and at least 5 feet (1524 mm) away from door and operable windows.
2. When the monitor or sensor is not integral to an Energy Management Control System (EMCS), the monitor or sensor shall display the carbon dioxide readings on the device. When the sensor is integral to an EMCS, the carbon dioxide readings shall be available to and regularly monitored by facility personnel.
3. A monitor shall provide notification though a visual indicator on the monitor when the carbon dioxide levels in the classroom have exceeded 1,100ppm. A sensor integral to an EMCS shall provide notification to facility personnel through a visual and/or audible indicator when the carbon dioxide levels in the classroom have exceeded 1,100ppm.
4. The monitor or sensor shall measure carbon dioxide levels at minimum 15- minute intervals and shall maintain a record of previous carbon dioxide measurements of not less than 30 days duration.
5. The monitor or sensor used to measure carbon dioxide levels shall have the capacity to measure carbon dioxide levels with a range of 400ppm to 2000ppm or greater.
6. The monitor or sensor shall be certified by the manufacturer to be accurate within 75ppm at 1,000ppm carbon dioxide concentration and shall be certified by the manufacturer to require calibration no more frequently than once every 5 years.

Y	N/A	RESPON. PARTY
☐	☒	

SECTION 5.507 ENVIRONMENTAL COMFORT

5.507.4 ACOUSTICAL CONTROL. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413, or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exception: [DSA-SS] For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

   Exceptions:

   1. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
   2. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1. Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{eq} - 1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance Method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site Features. Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of Compliance. An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

Y	N/A	RESPON. PARTY
☒	☐	MECH

SEE SPECS

SECTION 5.508 OUTDOOR AIR QUALITY

5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

Y	N/A	RESPON. PARTY
☐	☒	

5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.

Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.

5.508.2.1 Refrigerant piping. Piping compliant with the California Mechanical Code shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below,

5.508.2.1.1 Threaded pipe. Threaded connections are permitted at the compressor rack.

5.508.2.1.2 Copper pipe. Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.

5.508.2.1.2.1 Anchorage. One-fouth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

5.508.2.1.3 Flared tubing connections. Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

5.508.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

5.508.2.2 Valves. Valves Valves and fittings shall comply with the *California Mechanical Code* and as follows.

5.508.2.2.1 Pressure relief valves. For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

5.508.2.2.1.1 Pressure detection. A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

5.508.2.2.2 Access valves. Only Schrader access valves with a brass or steel body are permitted for use.

5.508.2.2.2.1 Valve caps. For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.

5.508.2.2.2.2 Seal caps. If designed for it, the cap shall have a neoprene O-ring in place.

5.508.2.2.2.2.1 Chain tethers. Chain tethers to fit ovr the stem are required for valves designed to have seal caps.

Exception: Valves with seal caps that are not removed from the valve during stem operation.

5.508.2.3 Refrigerated service cases. Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

5.508.2.3.1 Coil coating. Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

5.508.2.4 Refrigerant receivers. Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device tha indicates the level of refrigerant in the receiver.

5.508.2.5 Pressure testing. The system shall be pressure tested during installation prior to evacuation and charging.

5.508.2.5.1 Minimum pressure. The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging.

5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

5.508.2.6.2 Second vacuum. Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

5.508.2.6.3 Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS

702 QUALIFICATIONS

702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:

1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC-CG] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS

703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

6/24/2024 6:34:19 PM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN 3/31/25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY
600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 06-24-2024
SHEET TITLE:

CALGREEN

SCALE:

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

G122

GENERAL NOTES:

1. ALL WORK PERFORMED IN THIS CONTRACT SHALL CONFORM TO:
   - A. PROJECT SPECIFICATIONS.
   - B. THE LATEST EDITION AND SUPPLEMENTS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC) AND AMERICAN PUBLIC WORKS ASSOCIATION (APWA).
   - C. CALIFORNIA BUILDING CODE, LATEST VERSION.
2. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE WORK SPECIFIED ON THE DRAWINGS AND WITHIN THE VARIOUS NOTES SHOWN HEREIN.
3. THE EXISTING CONDITIONS SHOWN DIAGRAMMATICALLY ON THE PLANS ORIGINATED FROM AS BUILT DRAWINGS AND FIELD SURVEY. ANY DISCREPANCY SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT/OAR USING THE PROPER REQUEST FOR INFORMATION FORMS PRIOR TO SUBMITTING HIS BID FOR PROPER ACTION.
4. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES IN THE AREA OF WORK WHICH ARE NOT INCLUDED IN THIS CONSTRUCTION. ANY DAMAGE RESULTING FROM THIS WORK SHALL BE REPAIRED AND/OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.

   UNDERGROUND SERVICE ALERT:

5. BEFORE COMMENCING ANY EXCAVATION, THE CONTRACTOR SHALL OBTAIN AN UNDERGROUND SERVICE ALERT INQUIRY I.D. NUMBER BY CALLING 1-800-422-4133. TWO (2) WORKING DAYS SHALL BE ALLOWED AFTER THE I.D. NUMBER IS OBTAINED AND BEFORE THE EXCAVATION WORK IS STARTED SO THAT UTILITY OWNERS CAN BE NOTIFIED.

   PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS:

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PUBLIC AND PRIVATE PROPERTY ADJACENT TO THE WORK PER SECTION 01-1100 OF THE STANDARD SPECIFICATIONS.

   REMOVALS:

7. EXISTING STRUCTURES AND SUBSTRUCTURES WHICH ARE INDICATED TO BE REMOVED IN THIS CONSTRUCTION DOCUMENTS SHALL BE TOTALLY REMOVED AND DISPOSED OF OFFSITE, UNLESS OTHERWISE INDICATED. EXISTING FACILITIES WHICH ARE DISCOVERED DURING CONSTRUCTION (INCLUDING WALLS, FOOTINGS AND FOUNDATIONS) SHALL BE REPORTED TO AND COORDINATED WITH THE ARCHITECT AS TO THEIR REMOVAL. CONTRACTOR WILL NOTIFY THE IOR AND OAR IN WRITING PRIOR TO COMMENCING THE WORK.
8. ALL SITE PREPARATION AS INDICATED SHALL BE MADE UNDER THE CONTINUOUS INSPECTION OF THE IOR. SECURE THE REQUIRED PERMIT FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY FOR THE CONSTRUCTION OF TRENCHES, SHORING OR EXCAVATIONS WHICH ARE 5 FEET OR DEEPER OR WORK THAT MAY JEOPARDIZE THE WORKERS. SHORING CALCULATIONS SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR APPROVAL AND PERMITTING.
9. THE CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA SUFFICIENTLY DAMPENED TO CONTROL DUST CAUSED BY WORK ACTIVITIES AS REQUIRED BY THE DISTRICT AND JURISDICTIONAL AGENCY.
10. ALL FILL OR BACKFILL SHALL BE COMPACTED TO 90% MAXIMUM DENSITY PER GEOTECHNICAL REPORT.
11. CONSTRUCTION STAKING AND ADJUSTMENTS FOR IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE PERFORMED BY A LICENSED LAND SURVEYOR PAID FOR BY THE CONTRACTOR AND INCLUDED IN THE CONTRACT.
12. VOIDS RESULTING FROM REMOVAL WORK SHALL BE FILLED WITH SUITABLE MATERIALS APPROVED BY THE OWNER RETAINED GEOTECHNICAL ENGINEER AND COMPACTED TO 90% MAXIMUM DENSITY PER GEOTECHNICAL REPORT.
13. UPON COMPLETION OF THE PROJECT, CONTRACTOR SHALL REMOVE EXISTING CONSTRUCTION FENCING, APPURTENANCES AND OFFICE TRAILERS FROM THE SITE. PAVEMENT SHALL BE PATCHED AND REPAIRED TO MATCH ADJACENT PAVEMENT AND APPROVED BY THE IOR.
14. ANY ADDITIONAL SURVEYS OR TESTING AS A RESULT OF CONTRACTOR ERROR OR MISINFORMATION WILL BE CHARGED TO THE CONTRACTOR.
15. CONSTRUCT STRAIGHT GRADES BETWEEN ELEVATIONS SHOWN ON PLAN UNLESS INTERRUPTED BY A GRADE CHANGE LINE. ANY DEVIATION FROM THE GRADING PLAN MUST HAVE PRIOR APPROVAL FROM THE ARCHITECT.
16. GRADE LAWN, TURF, AND PLANTING AREA 1" BELOW DESIGN GRADES INDICATED.
17. ADJUST TO GRADE EXISTING MANHOLE RIMS, VALVE BOXES AND ELECTRICAL VAULT LIDS TO DESIGN GRADES WITHIN THE IMPROVEMENT AREA, UNLESS NOTED OTHERWISE.
18. MAINTAIN A RECORD OF LOCATION OF UTILITY MARKERS ON THE AS-BUILT PLAN AND REINSTALL THEM AFTER PAVING. REPLACE BENT OR UNUSABLE MARKERS FOR ALL UTILITY LINES DISCOVERED WITHIN THE WORK AREA. INSTALL BRASS UTILITY MARKERS INDICATING DIRECTIONS OF LINES AT ALL CHANGES IN DIRECTIONS AFTER PAVING. INFORM THE SURVEYOR TO LOCATE AND RECORD ACTUAL LOCATIONS.
19. IF EXISTING UTILITIES ARE EXPOSED OR DETERMINED TO EXIST UNDER THE ROUGH GRADING SITE, CONTRACTOR SHALL PROVIDE A FLAGGED STAKE THAT INDICATES THEIR LOCATION, TYPE OF UTILITY, SIZE, PIPE MATERIAL AND DEPTH. STAKES SHALL BE INSTALLED NO LESS THAN 50' ON CENTER ON STRAIGHT LINES AND AT BENDS.
20. UNCLOG, CLEAN AND FLUSH THE WORK AREA DRAINAGE SYSTEM AFTER PAVING AND IMMEDIATELY BEFORE A RAIN FORECAST.
21. ALL EXPORT OF MATERIAL FROM THE SITE MUST GO TO A PERMITTED SITE OR A LEGAL DUMPSITE. RECEIPTS FOR ACCEPTANCE OF EXCESS MATERIAL BY A DUMPSITE ARE REQUIRED AND MUST BE PROVIDED TO THE INSPECTOR OF RECORD UPON REQUEST.
22. A COPY OF THE GRADING PERMIT AND APPROVED GRADING PLANS MUST BE IN THE POSSESSION OF A RESPONSIBLE PERSON AND AVAILABLE AT THE SITE AT ALL TIMES.
23. SITE BOUNDARIES, EASEMENTS, DRAINAGE DEVICES, RESTRICTED USE AREAS SHALL BE LOCATED PER CONSTRUCTION STAKING BY A LICENSED SURVEYOR. PRIOR TO GRADING, AS REQUESTED BY THE INSPECTOR OF RECORD, ALL PROPERTY LINES, EASEMENTS, AND RESTRICTED USE AREAS SHALL BE STAKED.
24. IF GRADING AUTHORIZED BY THIS PLAN IS TO EXTEND THROUGH THE RAINY SEASON, APRIL THROUGH NOVEMBER. OF THE FOLLOWING YEAR, SEPARATE UPDATED PLANS FOR EROSION CONTROL MUST BE SUBMITTED PRIOR TO OCTOBER TO THE CITY ENGINEER FOR APPROVAL. CONTRACTOR TO PROVIDE STORM WATER PREVENTION PLAN, PRE-CONSTRUCTION AND POST CONSTRUCTION BMPs AND UPDATE FROM TIME TO TIME TO COMPLY WITH THE REQUIREMENTS.
25. CONTRACTOR SHALL INSTALL TEMPORARY FENCING AROUND THE PERIMETER OF THE CONSTRUCTION SITE AND STAGING AREA. FENCING SHALL BE MINIMUM 8' TALL AND SHALL HAVE A DUST/VISION BARRIER ALONG THE FULL LENGTH. THE DUST/VISION BARRIER SHALL EXTEND THE LENGTH OF THE CONSTRUCTION SITE. THE FENCING SHALL BE ANCHORED TO THE SURFACE AND SHALL BE ABLE TO WITHSTAND A 200-POUND HORIZONTAL POINT LOAD IN ANY DIRECTION. WORK AREA AND STAGING AREA SHALL BE SECURE AT ALL TIMES.
26. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS, INCLUDING NPDES, FROM THE APPROPRIATE JURISDICTIONAL AGENCIES FOR DISCHARGE OF GROUND WATER THAT MAY BE NECESSARY TO ACCOMPLISH EXCAVATIONS SHOWN ON THESE PLANS.

GENERAL NOTES (cont):

27. STORM DRAINAGE SYSTEMS SHOWN ON THESE PLANS HAVE BEEN DESIGNED FOR THE FINAL SITE CONDITION AT COMPLETION OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE DRAINAGE OF THE SITE, DURING INTERIM CONDITIONS OF CONSTRUCTION.
28. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE THE ARCHITECT WITH A COMPLETE SET OF REPRODUCIBLE "AS-BUILT" DRAWINGS OF ALL WORK PERFORMED UNDER THIS CONTRACT, AS SHOWN WITHIN THESE CONSTRUCTION DRAWINGS. ALL FIELD CHANGES SHALL BE SHOWN IN DETAIL ON THE "AS-BUILT" DRAWINGS AND SHALL INCORPORATE AS A MINIMUM, NEW ELEVATIONS, GRADES AND ALIGNMENT OF UNDERGROUND FACILITIES WITH DIMENSIONAL TIES TO BUILDINGS OR OTHER VISIBLE IMPROVEMENTS.
29. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY, AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
30. THE PROPOSED GRADE IS THE FINAL GRADE AND NOT THE ROUGH GRADE. THE CONTRACTOR SHALL SUBTRACT THE THICKNESS OF THE PAVED SECTION AND/OR LANDSCAPE TOPSOIL SECTION TO ARRIVE AT THE ROUGH GRADE ELEVATION.

LEGENDS:

- REMOVE EXISTING 3" AC PAVEMENT AND BASE MATERIAL, FULL DEPTH.
- REMOVE EXISTING 4" CONCRETE PAVEMENT AND BASE MATERIAL, FULL DEPTH.
- CLEAR, GRUB AND REMOVE EXISTING TURF/PLANTER/SHRUBS/EXPOSED SUBGRADE AREA. REMOVE EXISTING SHRUBS AND ROOTS IN THEIR ENTIRETY.
- NEW ASPHALT PAVEMENT
- NEW CONCRETE PAVEMENT
- NEW PLANTER AREA
- NEW WALL
- NEW STRIPING
- NEW CONCRETE PAVER
- CENTERLINE ----------
- PROPERTY LINE ----------
- RIGHT OF WAY ----------
- CABLE TV LINE----------
- ELECTRICAL LINE----------
- GAS LINE----------
- GRADE BREAK LINE ----------
- RIDGE LINE----------
- SEWER LINE----------
- STORM DRAIN LINE----------
- TELEPHONE LINE----------
- OVERHEAD WIRES----------
- WATER LINE----------
- FIRE HYDRANT ----------
- STREET LIGHT ----------
- TRAFFIC SIGNAL ----------
- TRAFFIC SIGNAL ARM & POLE ----------
- LIGHT STANDARD ----------
- UTILITY POLE ----------
- GUY WIRE & ANCHOR----------
- WATER METER ----------
- GAS METER ----------
- WATER VALVE----------
- GAS VALVE----------
- PULL BOX ----------
- GRATE INLET----------
- SIGN ----------
- VENT ----------
- SEWER MANHOLE----------
- STORM DRAIN MANHOLE ----------
- TELEPHONE MANHOLE ----------
- MANHOLE----------
- SEWER CLEANOUT ----------
- MONITORING WELL ----------
- HANDICAP PARKING STALL----------
- LANDSCAPED AREA----------
- PROTECT IN PLACE ----------
- REMOVE AND DISPOSE OFFSITE----------
- RELOCATE----------

LEGENDS (cont):

PLOTABLE EASEMENT ITEM NO. PER TITLE REPORT----------

EXIST. CONTOUR----------

DESIGN CONTOUR----------

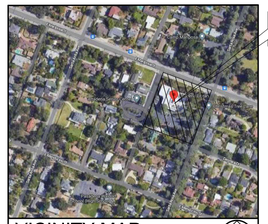
TREE, SPECIES VARIES LABELED TRE----------

PALM TREE LABELED TREE NUMBER----------

3 (427.0) 427.0 TW000 TF000

ABBREVIATIONS:

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
BLK	CONCRETE BLOCK
BS	BACK OF SIDEWALK
C	CALCULATED DATA
CB	CATCH BASIN
CF	CURB FACE
CL	CENTERLINE
CLF	CHAIN LINK FENCE
CO	CLEANOUT
D OR Δ	DELTA
DCV	DETECTOR CHECK VALVE
DS	ROOF DOWNSPOUT
E	EAST
EG	EDGE OF GUTTER
EO	ELECTRICAL OUTLET
EP	EDGE OF PAVEMENT
E/O	EAST OF
E'LY	EASTERLY
FDC	FIRE DEPT. CONNECTION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FS	FINISHED SURFACE
GB	GRADE BREAK
GM	GAS METER
GR	TOP OF GRATE
HB	HOSE BB
HP	HIGH POINT
HT	HEIGHT
ICV	IRRIGATION CONTROL VALVE
IP	IRON PIPE
L	LENGTH
LS	LIGHT STANDARD
L&T	LEAD & TAG
M	MEASURED DATA
MH	MANHOLE
N	NORTH
NG	NATURAL GROUND
N&T	NAIL & TAG
N/O	NORTH OF
N'LY	NORTHERLY
OHW	OVERHEAD WIRE
PB	PULL BOX
PCC	CONCRETE
PIV	POST INDICATOR VALVE
PL	PROPERTY LINE
PRO	PROPORTIONATE MEASUREMENT
R	RADIUS
RD	ROOF DRAIN
RWH	REDWOOD HEADER
R/W	RIGHT OF WAY
(RAD)	RADIAL BEARING
S	SOUTH
SCB	SIGNAL CONTROL BOX
SMH	SEWER MANHOLE
SPK	SPIKE
SW	SIDEWALK
S/O	SOUTH OF
S'LY	SOUTHERLY
T	TANGENT
TC	TOP OF CURB
TE	TRASH ENCLOSURE
TP	TELEPHONE CALL
TRAN	TRANSITION
TRANS	TRANSFORMER
TW	TOP OF WALL
UG	UNDERGROUND
UNK	UNKNOWN
UP	UTILITY POLE
VAR	VARIABLE
W	WEST
WDF	WOOD FENCE
WIF	WROUGHT IRON FENCE
WM	WATER METER
WV	WATER VALVE
W/O	WEST OF
W'LY	WESTERLY



VICINITY MAP
NOT TO SCALE

SHEET INDEX:

C-1.0	GENERAL NOTES, LEGENDS AND ABBREVIATIONS
C-1.1	TOPOGRAPHIC SURVEY
CD-1.0	SITE DEMOLITION PLAN
C-2.0	SITE CONTROL PLAN
C-3.0	OVERALL SITE GRADING PLAN
C-3.1	ENLARGED SITE GRADING PLAN
C-3.2	ENLARGED SITE GRADING PLAN
C-4.0	SITE UTILITY PLAN
C-5.0	MISCELLANEOUS DETAILS
C-5.1	MISCELLANEOUS DETAILS
C-5.2	MISCELLANEOUS DETAILS
C-5.3	MISCELLANEOUS DETAILS
C-6.0	EROSION CONTROL PLAN
C-6.1	EROSION CONTROL DETAILS

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO
MCA ENGINEERS, INC
CIVIL ENGINEERING • SURVEYING
1904 Kelly Avenue
Glendale, CA 91201
Tel. 323.726-6096
Fax. 323.726-0065

STAMP

REGISTERED PROFESSIONAL ENGINEER RONALD C. SCHLAFLY No. C36079 Exp. 06/30/26 CIVIL STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

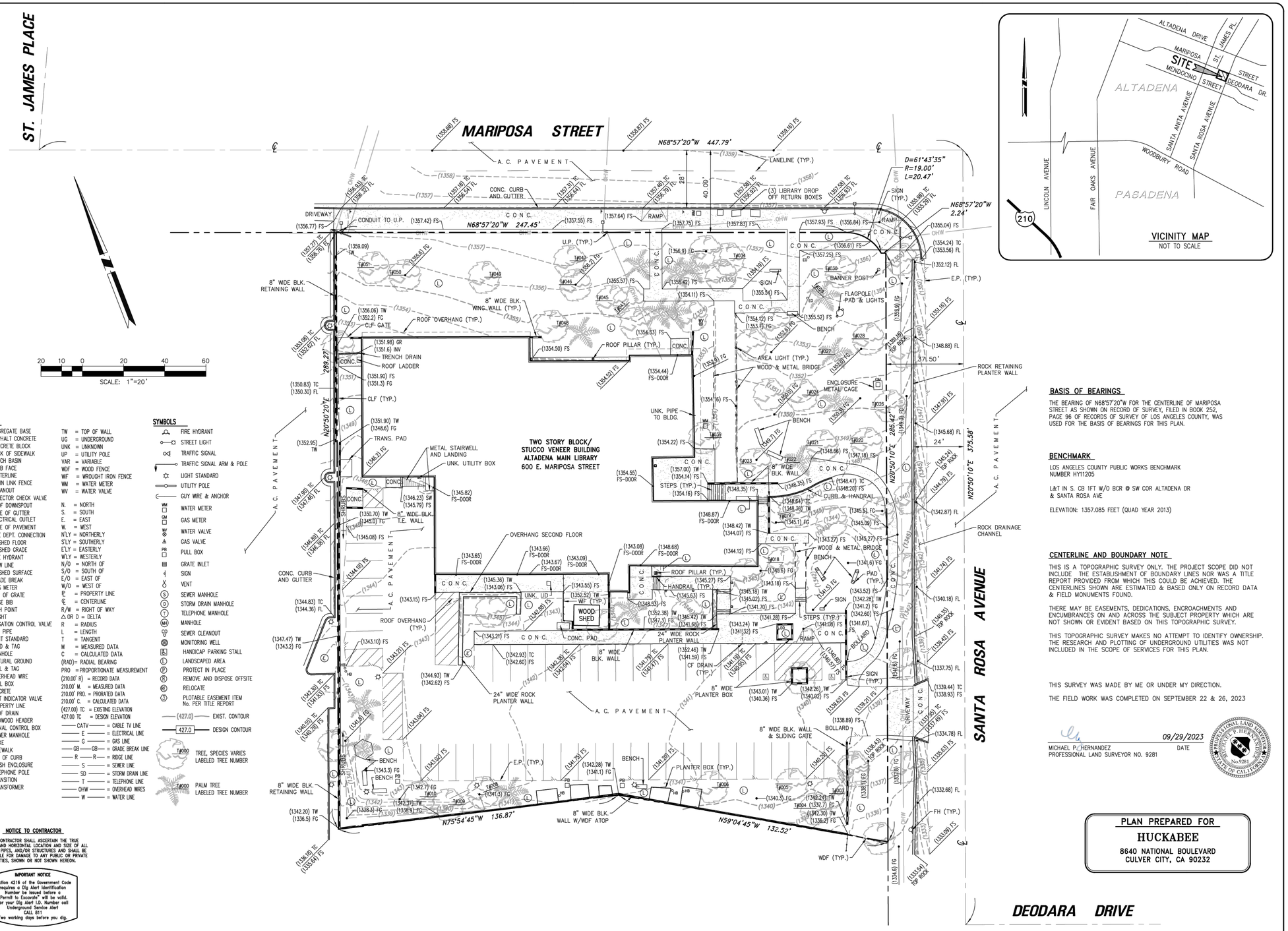
SHEET TITLE:

GENERAL NOTES, LEGENDS AND ABBREVIATION

SCALE: As indicated

All drawings and written materials herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-1.0



VICINITY MAP
NOT TO SCALE

LEGEND

AB	= AGGREGATE BASE	TW	= TOP OF WALL
AC	= ASPHALT CONCRETE	UG	= UNDERGROUND
BLK	= CONCRETE BLOCK	UNK	= UNKNOWN
BS	= BACK OF SIDEWALK	UP	= UTILITY POLE
CB	= CATCH BASIN	VAR	= VARIABLE
CF	= CURB FACE	WDF	= WOOD FENCE
CL	= CENTERLINE	WF	= WROUGHT IRON FENCE
CLF	= CHAIN LINK FENCE	WM	= WATER METER
CO	= CLEANOUT	WV	= WATER VALVE
DCV	= DETECTOR CHECK VALVE		
DS	= ROOF DOWNSPOUT	N.	= NORTH
EG	= EDGE OF GUTTER	S.	= SOUTH
EO	= ELECTRICAL OUTLET	E.	= EAST
EP	= EDGE OF PAVEMENT	W.	= WEST
FDC	= FIRE DEPT. CONNECTION	N'LY	= NORTHERLY
FF	= FINISHED FLOOR	S'LY	= SOUTHERLY
FG	= FINISHED GRADE	E'LY	= EASTERLY
FH	= FIRE HYDRANT	W'LY	= WESTERLY
FL	= FLOW LINE	N/O	= NORTH OF
FS	= FINISHED SURFACE	S/O	= SOUTH OF
GB	= GRADE BREAK	E/O	= EAST OF
GM	= GAS METER	W/O	= WEST OF
GR	= TOP OF GRATE	℄	= PROPERTY LINE
HB	= HOSE BIB	℄	= CENTERLINE
HP	= HIGH POINT	R/W	= RIGHT OF WAY
HT	= HEIGHT	△ OR D	= DELTA
ICV	= IRRIGATION CONTROL VALVE	R	= RADIUS
IP	= IRON PIPE	L	= LENGTH
LS	= LIGHT STANDARD	T	= TANGENT
L&T	= LEAD & TAG	M	= MEASURED DATA
MH	= MANHOLE	C	= CALCULATED DATA
NG	= NATURAL GROUND	(RAD)	= RADIAL BEARING
N&T	= NAIL & TAG	PRO	= PROPORTIONATE MEASUREMENT
OHW	= OVERHEAD WIRE	(210.00' R)	= RECORD DATA
PB	= PULL BOX	210.00' M.	= MEASURED DATA
PCC	= CONCRETE	210.00' PRO.	= PRORATED DATA
PIV	= POST INDICATOR VALVE	210.00' C.	= CALCULATED DATA
PL	= PROPERTY LINE	(427.00) TC	= EXISTING ELEVATION
RD	= ROOF DRAIN	427.00 TC	= DESIGN ELEVATION
RWH	= REDWOOD HEADER	CATV	= CABLE TV LINE
SCB	= SIGNAL CONTROL BOX	E	= ELECTRICAL LINE
SMH	= SEWER MANHOLE	G	= GAS LINE
SPK	= SPIKE	GB	= GRADE BREAK LINE
SW	= SIDEWALK	R	= RIDGE LINE
TC	= TOP OF CURB	S	= SEWER LINE
TE	= TRASH ENCLOSURE	SD	= STORM DRAIN LINE
TP	= TELEPHONE POLE	T	= TELEPHONE LINE
TRAN	= TRANSITION	OHW	= OVERHEAD WIRES
TRANS	= TRANSFORMER	W	= WATER LINE

SYMBOLS

- FIRE HYDRANT
- STREET LIGHT
- TRAFFIC SIGNAL
- TRAFFIC SIGNAL ARM & POLE
- LIGHT STANDARD
- UTILITY POLE
- GUY WIRE & ANCHOR
- WM — WATER METER
- GM — GAS METER
- WV — WATER VALVE
- PB — PULL BOX
- GRATE INLET
- SIGN
- VENT
- (S) — SEWER MANHOLE
- (D) — STORM DRAIN MANHOLE
- (T) — TELEPHONE MANHOLE
- (MH) — MANHOLE
- SEWER CLEANOUT
- (M) — MONITORING WELL
- HANDICAP PARKING STALL
- (L) — LANDSCAPED AREA
- (P) — PROTECT IN PLACE
- (R) — REMOVE AND DISPOSE OFFSITE
- (RE) — RELOCATE
- (E) — PLOTABLE EASEMENT ITEM No. PER TITLE REPORT
- (427.0) — EXIST. CONTOUR
- 427.0 — DESIGN CONTOUR
- T#000 — TREE, SPECIES VARIES LABELED TREE NUMBER
- T#000 — PALM TREE LABELED TREE NUMBER

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

BASIS OF BEARINGS

THE BEARING OF N68°57'20"W FOR THE CENTERLINE OF MARIPOSA STREET AS SHOWN ON RECORD OF SURVEY, FILED IN BOOK 252, PAGE 96 OF RECORDS OF SURVEY OF LOS ANGELES COUNTY, WAS USED FOR THE BASIS OF BEARINGS FOR THIS PLAN.

BENCHMARK

LOS ANGELES COUNTY PUBLIC WORKS BENCHMARK
NUMBER HY11205

L&T IN S. CB 1FT W/O BCR @ SW COR ALTADENA DR & SANTA ROSA AVE

ELEVATION: 1357.085 FEET (QUAD YEAR 2013)

CENTERLINE AND BOUNDARY NOTE

THIS IS A TOPOGRAPHIC SURVEY ONLY. THE PROJECT SCOPE DID NOT INCLUDE THE ESTABLISHMENT OF BOUNDARY LINES NOR WAS A TITLE REPORT PROVIDED FROM WHICH THIS COULD BE ACHIEVED. THE CENTERLINES SHOWN ARE ESTIMATED & BASED ONLY ON RECORD DATA & FIELD MONUMENTS FOUND.

THERE MAY BE EASEMENTS, DEDICATIONS, ENCROACHMENTS AND ENCUMBRANCES ON AND ACROSS THE SUBJECT PROPERTY WHICH ARE NOT SHOWN OR EVIDENT BASED ON THIS TOPOGRAPHIC SURVEY.

THIS TOPOGRAPHIC SURVEY MAKES NO ATTEMPT TO IDENTIFY OWNERSHIP. THE RESEARCH AND PLOTTING OF UNDERGROUND UTILITIES WAS NOT INCLUDED IN THE SCOPE OF SERVICES FOR THIS PLAN.

THIS SURVEY WAS MADE BY ME OR UNDER MY DIRECTION.

THE FIELD WORK WAS COMPLETED ON SEPTEMBER 22 & 26, 2023

09/29/2023
MICHAEL P. HERNANDEZ — DATE
PROFESSIONAL LAND SURVEYOR NO. 9281

PLAN PREPARED FOR
HUCKABEE
8640 NATIONAL BOULEVARD
CULVER CITY, CA 90232

FOR REFERENCE ONLY

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
1915 W. Orangewood Ave., Suite 101, Orange, CA 92868 (714) 935-0265 Truxaw.com

TOPOGRAPHIC SURVEY
ALTADENA MAIN LIBRARY
600 E. MARIPOSA STREET
ALTADENA IN THE UNINCORPORATED AREA OF THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

DATE	09/29/23
DRAWN BY	SDS
CHECKED BY	MPH
JOB NO.	ALD23042
SHEET NO.	1 OF 1 SHEETS

P:\ALD23042\CAD\ALD23042 Topo 9/29/2023 2:53:13 PM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO
MCA ENGINEERS, INC.
1041 S Sanford Avenue
City of Industry, CA 91748
Tel: 323.726.0081
Fax: 323.726.0041

STAMP
REGISTERED PROFESSIONAL ENGINEER
No. C 36079
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

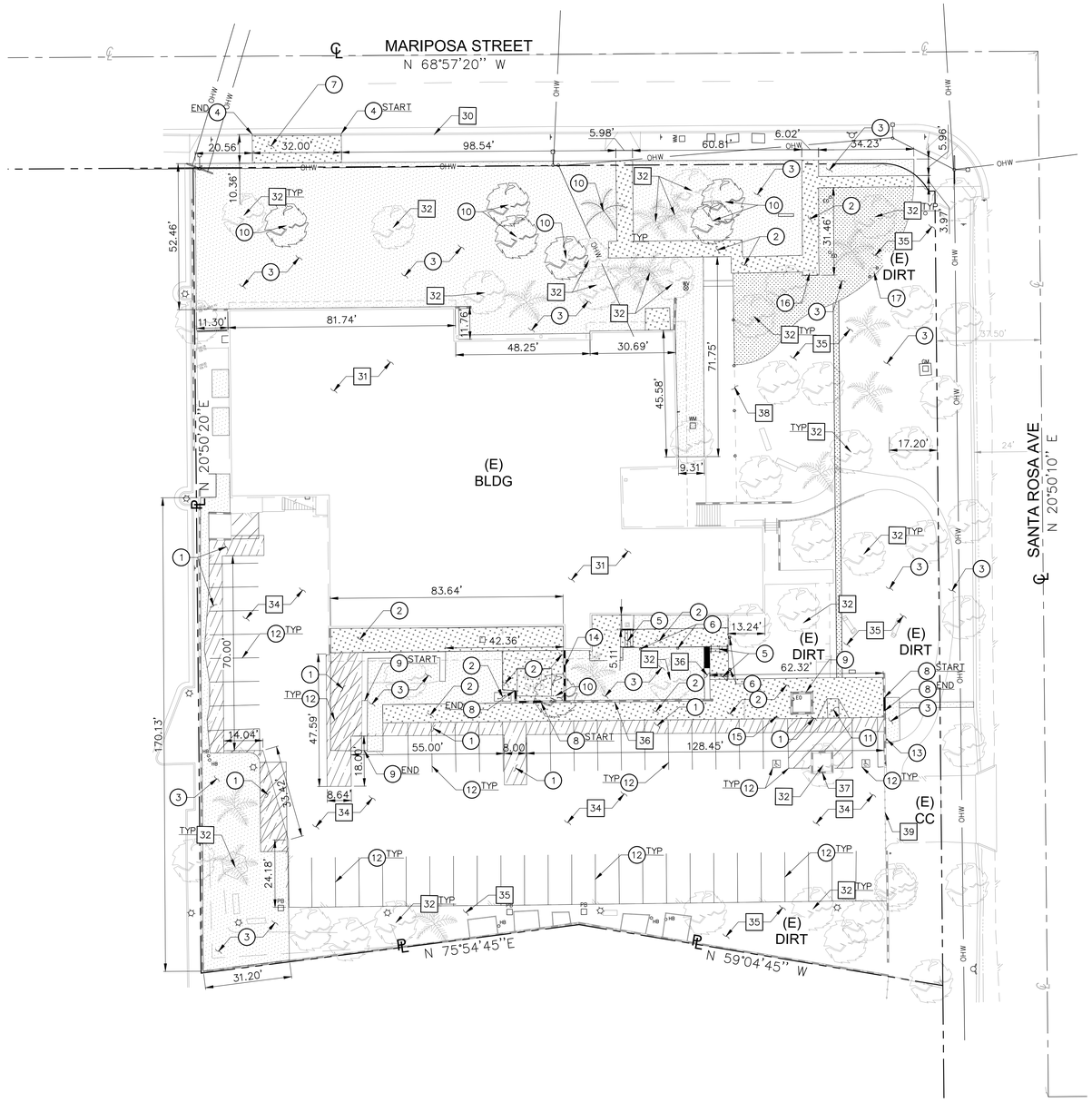
PROJECT TITLE:

ALTADENA MAIN LIBRARY
600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	TOPOGRAPHIC SURVEY
SCALE:	As indicated

All drawings and written materials herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-1.1



REMOVAL NOTES:

1. REMOVE EXISTING 3" THICK AC PAVEMENT AND BASE MATERIAL, FULL DEPTH.
2. REMOVE EXISTING 4" THICK CONCRETE PAVEMENT AND BASE MATERIAL, FULL DEPTH.
3. CLEAR, GRUB AND REMOVE EXISTING TURF/PLANTER/HEADER/EXPOSED SUBGRADE AREA. REMOVE EXISTING SHRUBS AND ROOTS.
4. REMOVE EXISTING CURB IN ITS ENTIRETY.
5. REMOVE EXISTING CONCRETE STAIR.
6. REMOVE EXISTING LIGHT POST.
7. REMOVE EXISTING CONCRETE SIDEWALK.
8. REMOVE EXISTING CMU WALL.
9. REMOVE EXISTING PLANTER WALL.
10. REMOVE EXISTING TREE.
11. REMOVE EXISTING CURB RAMP.
12. REMOVE EXISTING STRIPING.
13. REMOVE EXISTING BOLLARD.
14. REMOVE EXISTING RETAINING WALL.
15. REMOVE EXISTING SIGNAGE.
16. REMOVE EXISTING BENCH.
17. REMOVE EXISTING FLAGPOLE, BASE, LIGHTS AND FOOTING. RETURN FLAG TO OWNER.

PROTECT-IN-PLACE NOTES:

30. PROTECT IN PLACE EXISTING CONCRETE CURB.
31. PROTECT IN PLACE EXISTING BUILDING.
32. PROTECT IN PLACE EXISTING TREES, SHRUBS, SOD, ETC. COORDINATE WITH LANDSCAPE DRAWINGS.
33. PROTECT IN PLACE EXISTING CONCRETE PAVEMENT.
34. PROTECT IN PLACE EXISTING ASPHALT PAVEMENT. PROVIDE NEW SLURRY COAT.
35. PROTECT IN PLACE EXISTING PLANTER AREA.
36. PROTECT IN PLACE EXISTING CMU WALL.
37. PROTECT IN PLACE EXISTING PLANTER WALL.
38. PROTECT IN PLACE EXISTING WOODEN BRIDGE.
39. PROTECT IN PLACE EXISTING SLIDING GATE.

REMOVAL LEGEND:

REMOVE EXISTING 3" AC PAVEMENT AND BASE MATERIAL, FULL DEPTH.

REMOVE EXISTING 4" CONCRETE PAVEMENT AND BASE MATERIAL, FULL DEPTH.

CLEAR, GRUB AND REMOVE EXISTING TURF/PLANTER/SHRUBS/EXPOSED SUBGRADE AREA. REMOVE EXISTING SHRUBS AND ROOTS IN THEIR ENTIRETY.

SHEET NOTES:

1. FOR GENERAL NOTES, LEGENDS AND ABBREVIATIONS, SEE SHEET C-1.0.
2. SEE ARCHITECTURAL DRAWINGS FOR OTHER SITE RELATED DIMENSIONS NOT SHOWN ON THIS DRAWING.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND SURFACE AND/OR UNDERGROUND UTILITIES IN CONFLICT WITH THE PROPOSED DEMOLITION AND DESIGN ITEMS. CONTRACTOR SHALL REPORT ANY DISCREPANCIES AND/OR CONSTRUCTION RELATED ISSUES TO THE OWNER OR DESIGN TEAM PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR TO VERIFY IN FIELD THE JOINING TO EXISTING ELEVATION AND THE CURRENT SITE CONDITION WITH THE DESIGN GRADES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE OWNER OR DESIGN TEAM PRIOR TO THE COMMENCEMENT OF WORK.

SITE DEMOLITION PLAN

20 10 0 20 40

SCALE: 1"=20

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

VCA ENGINEERS, INC
CIVIL ENGINEERS
1041 S Stanford Avenue
Alhambra, CA 91801
Tel. 323.726.0556
Fax. 323.726.6043

STAMP

PROFESSIONAL ENGINEER
REGISTERED
No. 56079
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

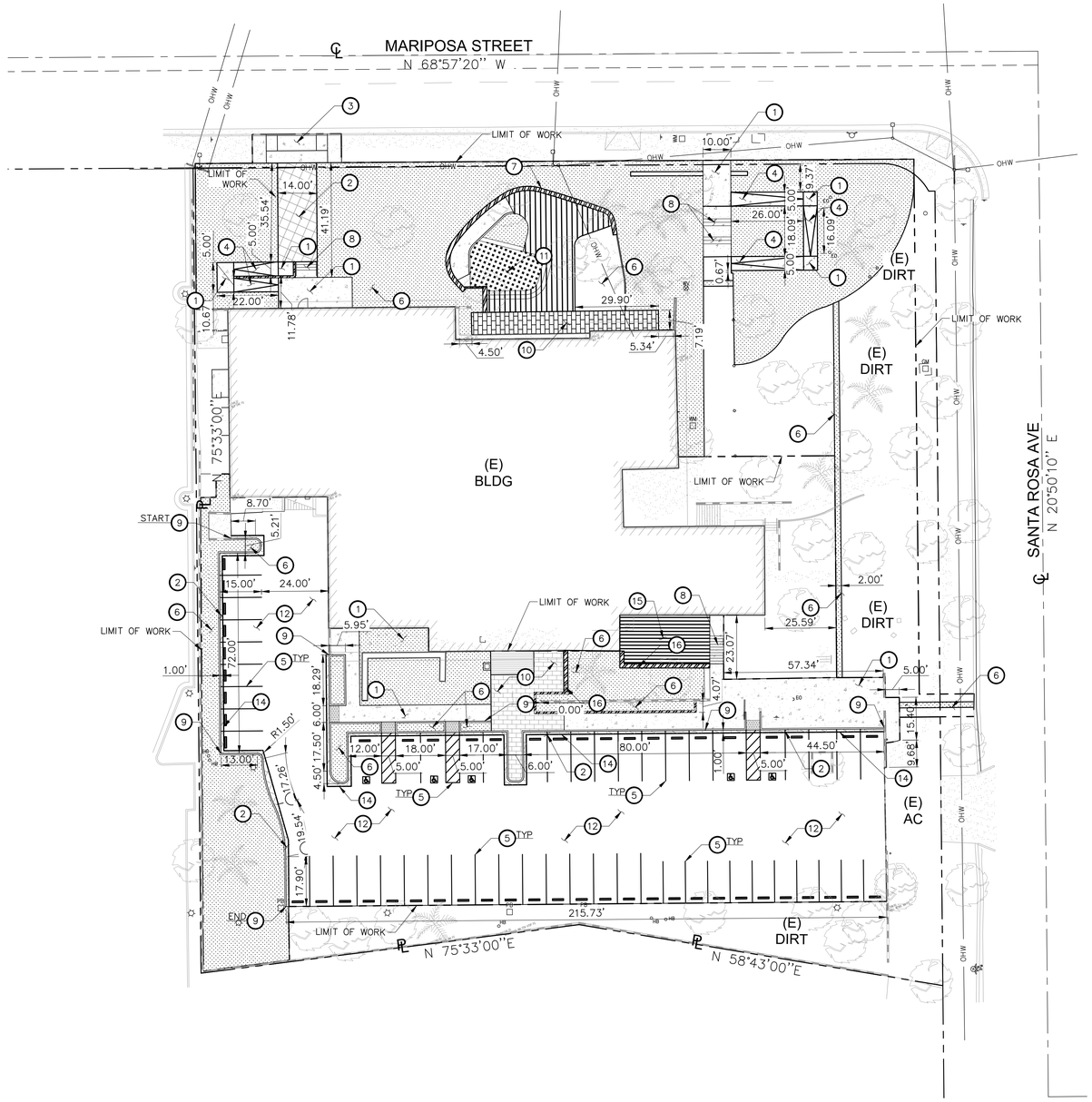
PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	

SITE DEMOLITION PLAN

SCALE: As indicated

All drawings and written material herein constitute original unpublished work of Anderson-Brule Architects and may not be duplicated without the written consent of Anderson-Brule Architects. ©

CD-1.0



CONSTRUCTION NOTES:

1. 4" THICK CONCRETE PAVEMENT OVER 4" BASE PER DETAIL 1 ON SHEET C-5.0.
2. 3" THICK ASPHALT PAVEMENT OVER 4" BASE PER DETAIL 9 ON SHEET C-5.0.
3. CONSTRUCT DRIVEWAY PER CITY OF LOS ANGELES STANDARD DRAWING S-440-4.
4. CONSTRUCT CONCRETE RAMP PER ARCHITECTURAL DRAWINGS.
5. NEW STRIPING PER ARCHITECTURAL DRAWINGS.
6. NEW PLANTER AREA PER LANDSCAPE DRAWINGS.
7. CONSTRUCT GRAVITY WALL PER DETAIL 3 ON SHEET C-5.0.
8. CONSTRUCT CONCRETE STAIRS/HANDRAIL PER LANDSCAPE DRAWING 7/L110.
9. CONSTRUCT CONCRETE CURB PER DETAIL 8 ON SHEET C-5.0.
10. CONSTRUCT CONCRETE PAVERS PER LANDSCAPE DRAWINGS.
11. INSTALL SYNTHETIC TURF PER LANDSCAPE DRAWINGS.
12. PROVIDE NEW SLURRY COAT FOR EXISTING ASPHALT PAVEMENT.
13. INSTALL CONTROL JOINTS, EXPANSION JOINTS AND CONSTRUCTION JOINT. SEE DETAIL 2 ON SHEET C-5.0.
14. SAWCUT AND JOIN TO MATCH EXISTING CONDITION.
15. INSTALL WOODEN PLATFORM PER LANDSCAPE DRAWINGS.
16. CONSTRUCT CONCRETE BENCH PER LANDSCAPE DRAWINGS.

LEGENDS:

- NEW ASPHALT PAVEMENT
- NEW CONCRETE PAVEMENT
- NEW PLANTER AREA
- NEW WALL
- NEW STRIPING
- NEW CONCRETE PAVER

SHEET NOTES:

1. FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS, SEE SHEETS C-1.0.
2. REFER TO ARCHITECTURAL DRAWINGS FOR OTHER SITE DIMENSIONS AND IMPROVEMENTS NOT SHOWN ON THIS DRAWING.

SITE CONTROL PLAN

20 10 0 20 40

SCALE: 1"=20

ABA

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
1041 N Garfield Avenue
Monterey Park, CA 91754
Tel. 323.729.8058
Fax. 323.729.8043

STAMP

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER C. KOO
No. C36079
Exp. 12/31/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

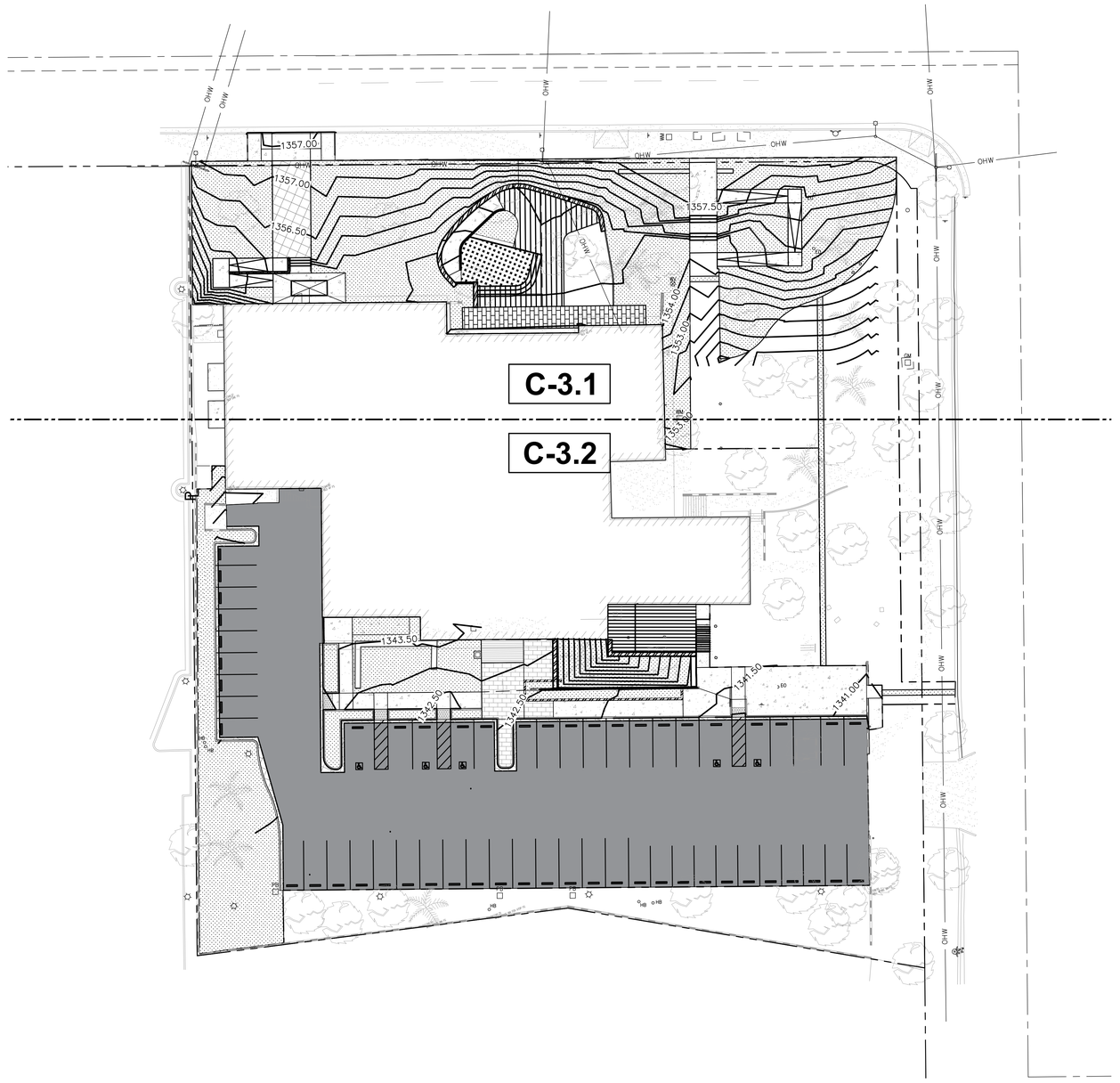
SHEET TITLE:

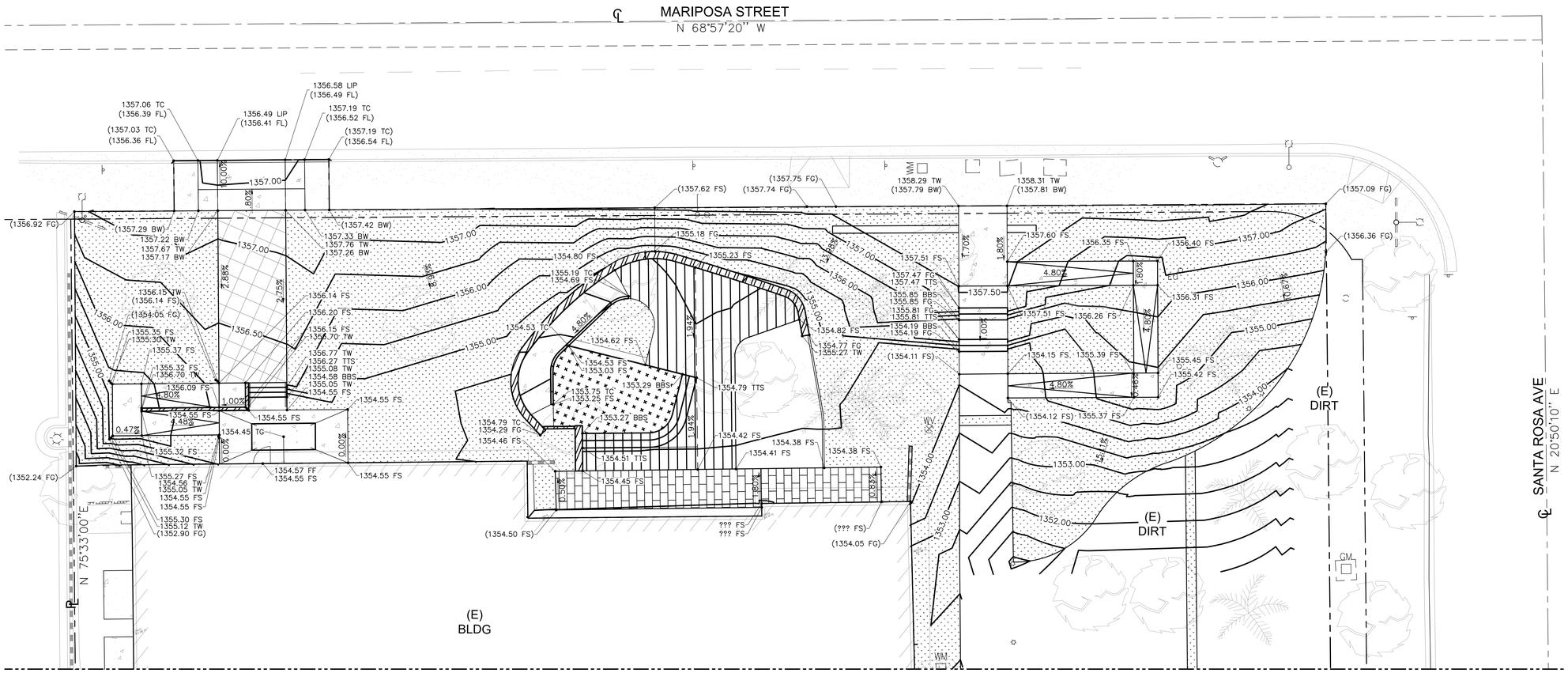
SITE CONTROL PLAN

SCALE: As indicated

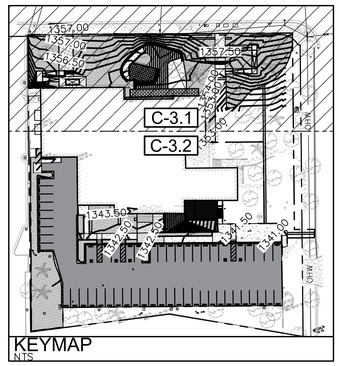
All drawings and written material herein constitute original work of the Architect and Anderson-Brulé Architects and may not be duplicated without the consent of Anderson-Brulé Architects. ©

C-2.0


C-3.1
C-3.2
1357.00
1357.00
1356.50
1357.50
1354.00
1353.00
1353.00
1343.50
1342.50
1342.50
1341.50
1341.00
OHW
OHW
OHW



SEE MATCHLINE ON SHEET C-3.2



ELARGED SITE GRADING PLAN

20 10 0 20 40

SCALE: 1"=20

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC.
CIVIL ENGINEERING
1001 S Sanford Avenue
La Puente, CA 91746
Tel. 323.726.6000
Fax. 323.728.6045

STAMP

PROFESSIONAL ENGINEER
CHRISTOPHER C. CHEUNG
No. C58079
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

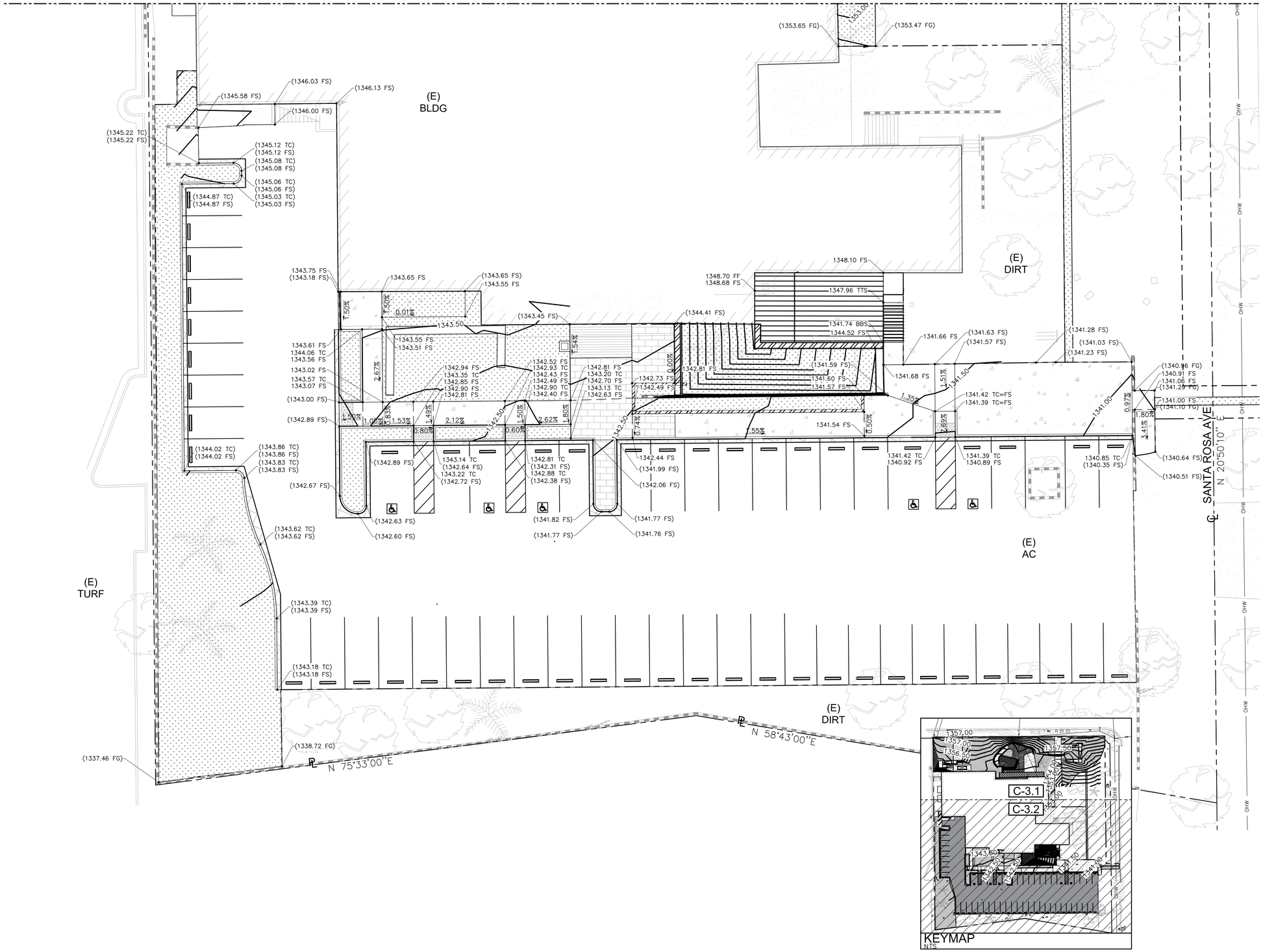
ENLARGED SITE GRADING PLAN

SCALE: As indicated

All drawings and written material herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the consent of Anderson-Brulé Architects. ©

C-3.1

SEE MATCHLINE ON SHEET C-3.1



ENLARGED SITE GRADING PLAN

20 10 0 20 40

SCALE: 1"=20

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
CIVIL | STRUCTURAL
1001 S Sanford Avenue
City of Industry, CA 91748
Tel. 323.726.8080
Fax. 323.729.6945

STAMP

REGISTERED PROFESSIONAL ENGINEER
No. C36079
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

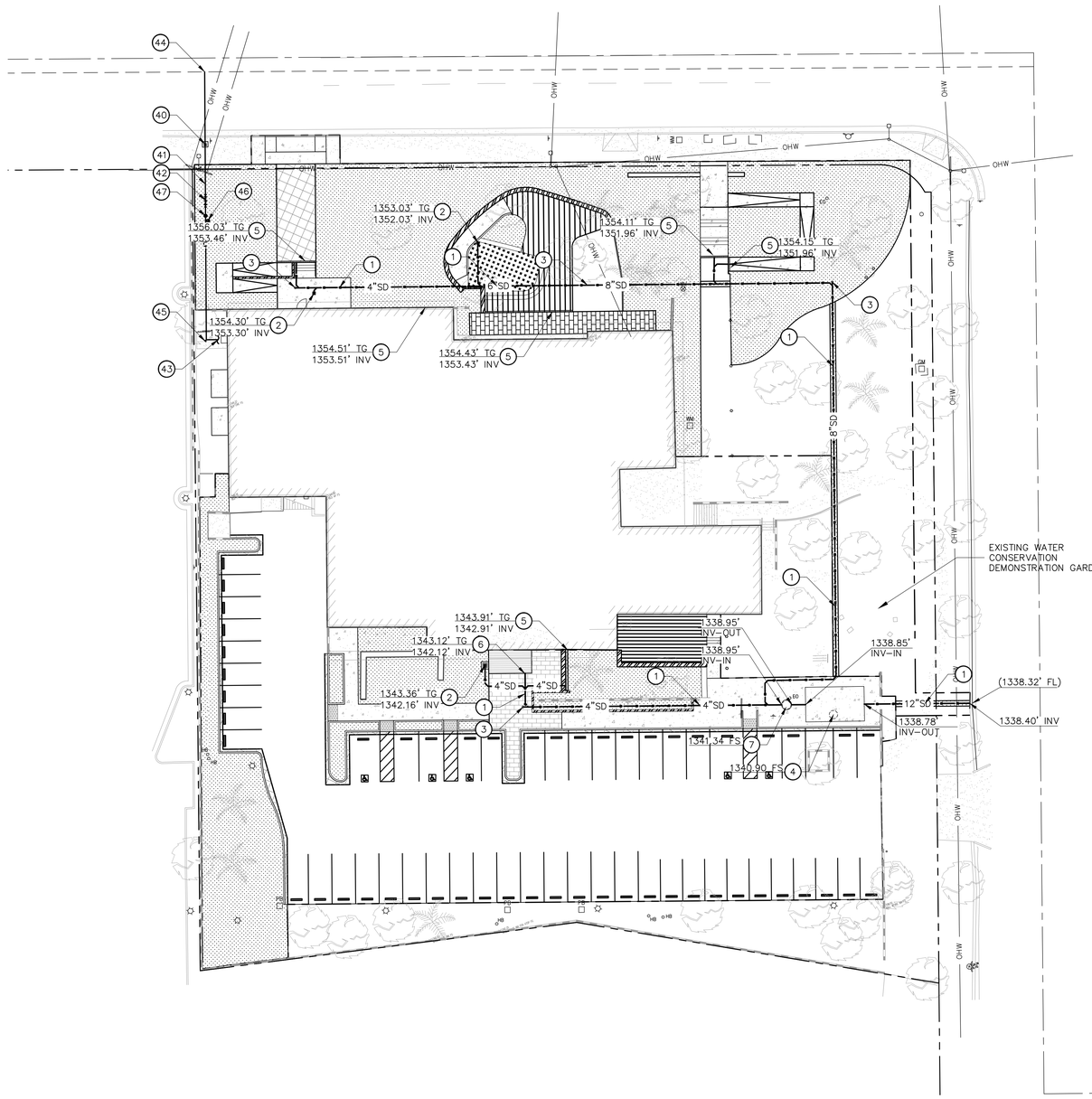
SHEET TITLE:

ENLARGED SITE GRADING PLAN

SCALE: As indicated

All drawings and written materials herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-3.2



CONSTRUCTION NOTES:
STORM DRAINAGE:

1. INSTALL SCH 40 STORM DRAIN PIPE, BEDDING PER DETAIL 4 ON SHEET C–5.0. PIPE SIZE PER PLAN.
2. CONSTRUCT 12"X12" CATCH BASIN PER DETAIL 7 ON SHEET C–5.0. INSTALL FILTER INSERT PER DETAIL 1 ON SHEET C–5.3.
3. INSTALL CLEAN OUT PER DETAIL 6 SHEET C–5.0.
4. INSTALL CONTECH CMP INFILTRATION SYSTEM PER DETAIL1 ON SHEET C–5.2 & C–5.3.
5. INSTALL TRENCH DRAIN PER DETAIL 5 ON SHEET C–5.0.
6. CONNECT TO WALK–OFF GRILL UNDER DRAIN SYSTEM.
7. INSTALL CDS PRE–TREATMENT UNIT PER DETAIL 2 ON SHEET C–5.3.

FIRE WATER:

40. INSTALL NEW 4"ø FIRE WATER METER, COORDINATE WITH WATER PURVEYOR PRIOR TO ORDERING AND INSTALLATION.
41. INSTALL 4"ø AWWA C900 FIRE WATER LINE. BEDDING PER DETAIL 4 ON SHEET C–5.0.
42. INSTALL 4"ø FIRE WATER ZURN MODEL 350DA DOUBLE CHECK DETECTOR ASSEMBLY PER DETAIL 2 ON SHEET C–5.3. COORDINATE WITH WATER PURVEYOR FOR ACCEPTABLE/APPROVED DEVICE. VERIFY LOCATION IN FIELD.
43. CONNECT TO BUILDING FIRE WATER LINE. COORDINATE AND MATCH LOCATION WITH BUILDING PLUMBING. PROVIDE REDUCER FITTINGS AS REQUIRED TO MATCH/JOIN WITH BUILDING PLUMBING.
44. POINT OF CONNECTION TO EXISTING WATER MAINLINE COORDINATE WITH THE UTILITY PURVEYOR FOR CONNECTION REQUIREMENT. CONTRACTOR TO PAY FOR PERMIT AND FEES.
45. INSTALL THRUST BLOCK PER DETAIL 3 ON SHEET C–5.3.
46. INSTALL FIRE DEPARTMENT CONNECTION PER DETAIL 4 ON SHEET C–5.3.
47. INSTALL POST INDICATOR VALVE PER DETAIL 5 ON SHEET C–5.3.

SHEET NOTES:

1. FOR GENERAL NOTES, LEGENDS AND ABBREVIATIONS, SEE SHEET C–1.0.
2. SEE ARCHITECTURAL DRAWINGS FOR OTHER SITE RELATED DIMENSIONS NOT SHOWN ON THIS DRAWING.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL SURFACE AND/OR UNDERGROUND UTILITIES IN CONFLICT WITH THE PROPOSED DEMOLITION AND DESIGN ITEMS. CONTRACTOR SHALL REPORT ANY DISCREPANCIES AND/OR CONSTRUCTION RELATED ISSUES TO THE OWNER OR DESIGN TEAM PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR TO VERIFY IN FIELD THE JOINING TO EXISTING ELEVATION AND THE CURRENT SITE CONDITION WITH THE DESIGN GRADES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO THE COMMENCEMENT OF WORK.
5. CONTRACTOR SHALL VERIFY WITH LANDSCAPE ARCHITECT BEFORE UTILITY TRENCHING WITHIN EXISTING WATER CONSERVATION DEMONSTRATION GARDEN.

SITE UTILITY PLAN

20 10 0 20 40

SCALE: 1"=20

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS INC
1041 S Garfield Avenue
Alhambra, CA 91801
Tel. 323.729.8008
Fax. 323.729.6043

STAMP

REGISTERED PROFESSIONAL ENGINEER
TIMOTHY C. KOCH
No. 83079
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

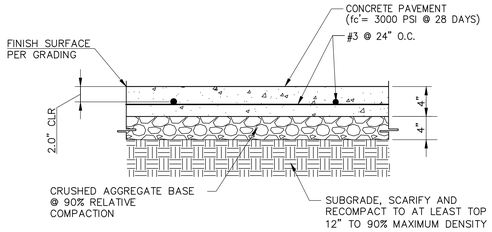
SHEET TITLE:

SITE UTILITY PLAN

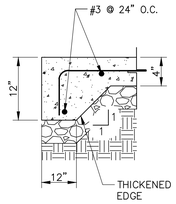
SCALE: As indicated

All drawings and written material herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-4.0



LOCATION	CONCRETE PAVEMENT THICKNESS "A"	CRUSHED AGGREGATE BASE THICKNESS "B"
NON TRAFFIC	4"	4"

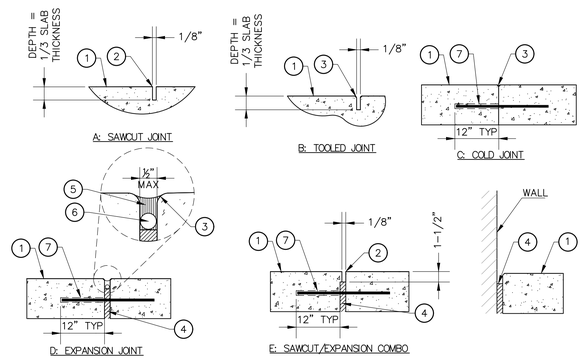


EDGE OF RIGID PAVEMENT

NOTES:

1. FOR CONSTRUCTION JOINTS, EXPANSION JOINTS, AND FINISH SURFACE REQUIREMENTS REFER TO DETAIL 3 ON THIS SHEET.
2. CONCRETE, fc'=4000 PSI @ 28 DAYS. REBARS, fy=60,000 PSI PER ASTM A615.
3. CONCRETE FINISHES TO BE EQUIVALENT TO MEDIUM SALTED FINISH FOR SLOPES OF LESS THAN 6%, AND SLIP RESISTANT FOR SLOPES 6% OR GREATER.
4. CONCRETE PAVEMENT SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF ALL FIRE APPARATUS & SHALL BE SURFACED SO AS TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES FOR FIRE LANE.
5. REFER TO LANDSCAPE DRAWINGS FOR INTEGRAL COLOR AND FINISH.

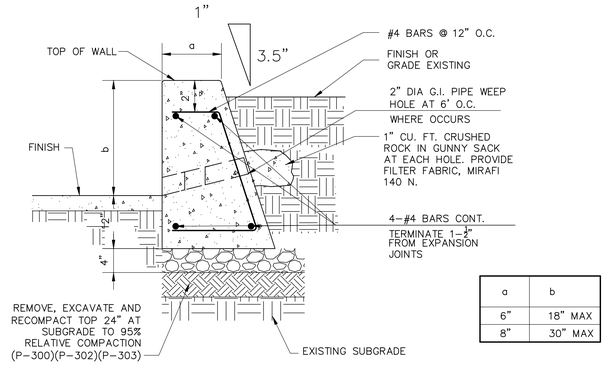
1 CONCRETE PAVEMENT DETAIL
NOT TO SCALE



LEGEND:

1. PAVING FINISH SURFACE.
2. SAWCUT.
3. 1/4" R. @ EDGES. TYP.
4. PREMOLDED E.J. FILLER.
5. JOINT SEALANT. COLOR TO BE SELECTED BY ARCHITECT. SUBMIT COLOR SAMPLES PRIOR TO INSTALLATION.
6. BACKER ROD.
7. 18" #3 REBAR W/ 'SPEED DOWEL' @ 18" OC, CENTER IN CONC. AT COLD JOINTS & E.J.'S.
8. CONTROL JOINTS 20'-0" O.C. MAX.
9. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF CONTROL JOINT AND EXPANSION JOIN LAYOUT.

2 JOINT DETAILS
NOT TO SCALE

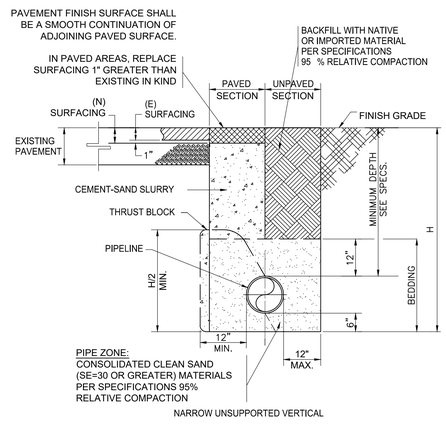


a	b
6"	18" MAX
8"	30" MAX

NOTES:

1. PROVIDE ¼" EXPANSION JOINT WITH PREFORMED JOINT FILLER AT ALL ANGLE POINTS AND THE BEGINNING AND END OF ALL CURVES.
2. PROVIDE CONTRACTION JOINTS CONSISTING OF ONE INCH DEEP CUT SCORES AT 20' O.C. MAX UNLESS OTHERWISE NOTED BY SIDEWALK OR PAVEMENT JOINT PATTERN.
3. WHERE A WALK IS ADJACENT TO THE CURB, ALL JOINTS IN THE CURB SHALL LINE WITH ALL JOINTS IN THE WALK.
4. CONCRETE, fc'=3000 psi @ 28 DAYS PER SSPWC.
5. REBARS, fy=60,000 psi ASTM A615.
6. THE EXISTING GRADE IN THIS AREA SHOULD BE REMOVED AND RECOMPACTED A MINIMUM OF 24" BELOW THE SUBGRADE ELEVATION. THE SOILS SHOULD BE BROUGHT TO THE OPTIMUM MOISTURE CONTENT AND RE-COMPACTED TO 95 PERCENT OF THE MAXIMUM DENSITY PER SOILS REPORT.
7. SEE SOILS REPORT FOR UNDERLAYMENT REQUIREMENTS.

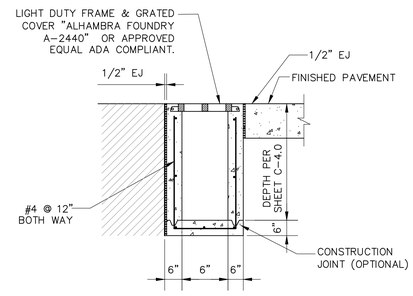
3 GRAVITY WALL DETAIL
NOT TO SCALE



WALLED TRENCH WIDTH

NOMINALPIPE DIAMETER (INCHES)	NARROW TRENCH WIDTH MIN. (INCHES)
4	18
6	18
8	24
12	36

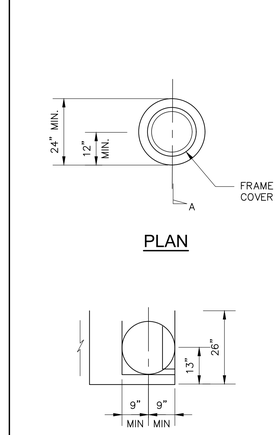
4 UTILITY TRENCH DETAIL
NOT TO SCALE

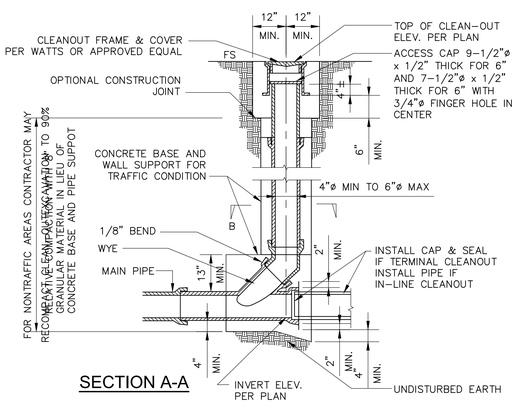


NOTES:

1. THE SLOPE IN THE TRENCH DRAIN SHALL BE 1% MINIMUM
2. FOR THE ELEVATION OF THE CONCRETE SEE DRAWING.
3. FOR LOCATION OF DISCHARGE PIPE, SEE DRAWING.
4. GRATE SHALL BE A.D.A. COMPLIANT, HEEL PROOF, AND VANDAL RESISTANT
5. INSTALL TRENCH DRAIN FILTER.

5 TRENCH DRAIN DETAIL
NOT TO SCALE

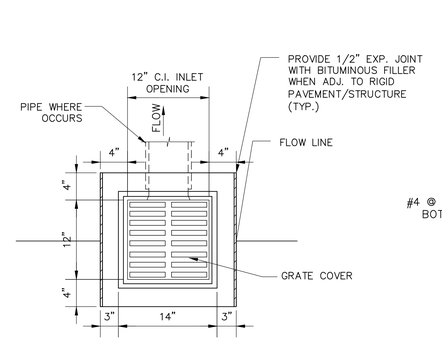


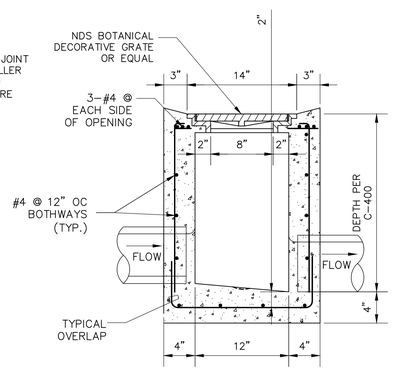


NOTES:

1. FOR STORM DRAINAGE CLEAN OUT COVER, PROVIDE COVER WITH INSCRIPTION "D" TO DENOTE STORM DRAINAGE.

6 CLEANOUT DETAIL
NOT TO SCALE



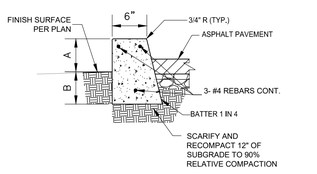


NOTES:

1. USE 3/4" DIA. PIPE BAR SPACERS ASSEMBLED ON (2) 1/2" DIA. RODS WITH THREADS AND NUTS AT BOTH ENDS.
2. ALL METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION AND WELDING, AND
3. BEFORE ASSEMBLING.
4. FRAME AND GRATE SHALL BE SIMILAR TO ALHAMBRA FOUNDRY CO. LTD. SERIES MODEL NO. 1581 OR BROOKS PRODUCTS, INC. OR APPROVED EQUAL.
5. CONCRETE, FC'=3,000 PSI @ 28 DAYS PER SSPWC.
6. CATCH BASIN ALTERNATE CAN BE PREFABRICATED AVAILABLE ON THE MARKET.

PROVIDE LABEL WITH "NO DUMPING DRAINS TO OCEAN" AT ALL DRAINAGE INLETS PER DETAIL 3 ON SHEET C-503.

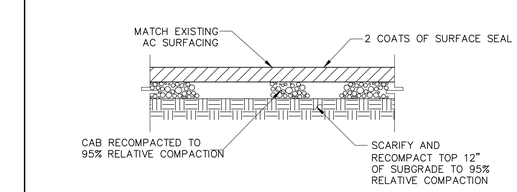
7 12"X12" CATCH BASIN DETAIL
NOT TO SCALE



NOTES:

1. WHEN "A" IS 6" OR LESS, B=6".
2. WHEN "A" IS GREATER THAN 6" AND LESS THAN OR EQUAL TO 12", A=B.
3. WHEN "A" IS GREATER THAN 12" AND LESS THAN OR EQUAL TO 18", B=18".
4. WHEN THE SUM OF "A" PLUS "B" IS 18" OR GREATER, PLYWOOD FORM IS REQUIRED.
5. PROVIDE EXPANSION JOINTS AT 30'-0" O.C. MAX.
6. TERMINATE REBARS 1/2" FROM EXPANSION JOINT.

8 CONCRETE CURB DETAIL
NOT TO SCALE



LOCATION	ASPHALT CONCRETE	BASE COURSE	
	THICKNESS	THICKNESS	TYPE
PARKING	3"	4"	CLASS 2 AGGREGATE BASE

NOTES:

1. ASPHALT PAVEMENT SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF ALL FIRE APPARATUS & SHALL BE SURFACED SO AS TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES FOR FIRE LANE.

9 ASPHALT PAVEMENT DETAIL
NOT TO SCALE

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
1581 S Sunkist Avenue
Ontario, CA 91761
Ph. 909.923.4566
Fax. 323.728.8045

STAMP

REGISTERED PROFESSIONAL ENGINEER
No. C36079
Exp. 9/30/26
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	

MISCELLANEOUS DETAILS

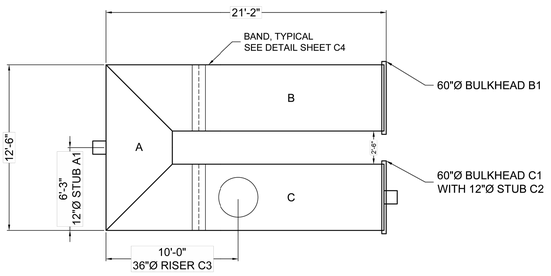
SCALE: As indicated

All drawings and written materials herein constitute originals and property of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-5.0

STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
12"Ø STUB A1	1,338.85	1,334.90
12"Ø STUB C2	1,338.78	1,334.90

RISER INFORMATION		
PIECE	RIM ELEV.	SYSTEM INVERT
36"Ø RISER C3	1,340.90	1,334.90



THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (5) PAGES INCLUDING THE FOLLOWING:

- **PIPE STORAGE = 874 CF**
- **MAINLINE PIPE GAGE = 16**
- **WALL TYPE = PERFORATED**
- **DIAMETER = 60"**
- **FINISH = ALT2**
- **CORRUGATION = 5x1**

CUSTOMER DATE

ASSEMBLY

SCALE: 1" = 5'

STRUCTURAL BACKFILL STORAGE: 317 CF
TOTAL STORAGE PROVIDED: 1191 CF
LOADING: H20
PIPE INV. = 1339.60'±

NOTES

- THE PIPE SHOULD BE FULLY PERFORATED IN ACCORDANCE WITH AASHTO M 36, SECTION 8.3.2.2, AND USING CLASS 2 PERFORATIONS. THE TOTAL OPEN AREA OF THE PERFORATIONS WILL BE A MINIMUM OF 2.3% OF THE PIPE SURFACE AREA.
- BULKHEADS SHALL BE 12-GAGE OR HEAVIER STEEL AND THE COATING WILL MATCH THE SPECIFIED CMP COATING. BULKHEAD PLATES SHALL BE FULLY WELDED ONTO THE CMP WITH STEEL REINFORCEMENT AS REQUIRED. THE STEEL REINFORCEMENT SHALL BE POST COATED WITH ZINC RICH PAINT PER AASHTO M 36. BULKHEAD DESIGNS SHALL SATISFY THE REQUIREMENTS SHOWN IN CHAPTER 8 OF THE NCSPA CSP DESIGN MANUAL AND CALCULATIONS SHALL BE PROVIDED TO THE ENGINEER OF RECORD (EOR) FOR APPROVAL UPON REQUEST.
- ALL FITTINGS SHALL BE STRUCTURALLY CHECKED FOR REINFORCEMENTS PER ASTM A998 AND PROVIDED TO THE EOR FOR APPROVAL UPON REQUEST.
- CONNECTING BANDS FOR INFILTRATION SYSTEMS SHALL BE ANY TYPE, BUT MUST BE AT LEAST 12" WIDE. BANDS SHALL MATCH THE SPECIFIED CMP COATING AND MEET THE REQUIREMENTS OF AASHTO M 36.
- ALL METALLIC COATINGS AFFECTED BY MANUFACTURING FABRICATION SHALL BE REPAIRED PER AASHTO M 36 SECTION 11 REQUIREMENTS (E.G. ZINC-RICH PAINT ON ALL WELDS). IF POLYMER COATINGS ARE USED THE REPAIR OF DAMAGED COATINGS WILL BE IN CONFORMANCE WITH AASHTO M 245 SECTION 11 REQUIREMENTS.

THE DESIGN AND INFORMATION SHOWN ON THIS DRAWING IS PROVIDED AS A SERVICE TO THE PROJECT OWNER, ENGINEER AND CONTRACTOR BY CONTECH ENGINEERED SOLUTIONS LLC ("CONTECH"). NEITHER THIS DRAWING NOR THE INFORMATION SHOWN HEREON MAY BE USED, REVISED OR ALTERED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF CONTECH. FAILURE TO COMPLY IS DONE AT THE USER'S OWN RISK AND CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR SUCH USE.

IF DISCREPANCIES BETWEEN THE SUPPLIED INFORMATION UPON WHICH THE DRAWING IS BASED AND ACTUAL FIELD CONDITIONS ARE ENCOUNTERED AS WORK PROGRESSES, THESE DISCREPANCIES MUST BE REPORTED TO CONTECH IMMEDIATELY FOR re-evaluation OF THE DESIGN. CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR ANY LOSS, INCLUDING, WITHOUT LIMITATION, LOSS OF USE, INCURRED AS A RESULT OF ERRONEOUS, INCOMPLETE OR INACCURATE INFORMATION SUPPLIED BY OTHERS.

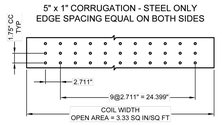
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

60"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 797134-010
ALTADENA MAIN LIBRARY
ALTADENA, CA
SITE DESIGNATION: CMP #1

PROJECT No.:	SEQ. No.:	DATE:
797134	010	5/15/2024
DESIGNED: EDMA	DRAWN: EDMA	
CHECKED: SJ	APPROVED: EDMA	
SHEET NO.: C1	OF 5	



NOTES:
1. PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
2. PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
3. DIMENSIONS SUBJECT TO MANUFACTURER'S TOLERANCES.
4. ALL HOLES 3/8"Ø.

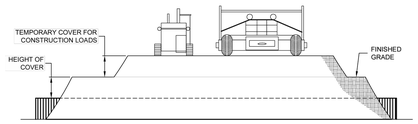
EXFILTRATION AREA
STANDARD PERFORATION PATTERNS

APPROXIMATE AREA PER LINEAR FOOT OF PIPE				
PIPE	CORRUGATION PATTERN			
	2 2/3" x 1/2"	3" x 1"	5" x 1"	ULTRA FLO
60"Ø	61.1 SQ. IN.	64.5 SQ. IN.	62.8 SQ. IN.	

NOTES:
- GAGE AND COATING LIMITATIONS APPLY. 5" x 1" IS NOT AVAILABLE IN ALUMINUM.
- DIMENSIONS SUBJECT TO MANUFACTURER'S TOLERANCES.

TYPICAL PERFORATION DETAIL

NOT TO SCALE



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

NOT TO SCALE

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

ANTI-FLOTATION PROVISIONS DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION

NOT TO SCALE

THE DESIGN AND INFORMATION SHOWN ON THIS DRAWING IS PROVIDED AS A SERVICE TO THE PROJECT OWNER, ENGINEER AND CONTRACTOR BY CONTECH ENGINEERED SOLUTIONS LLC ("CONTECH"). NEITHER THIS DRAWING NOR THE INFORMATION SHOWN HEREON MAY BE USED, REVISED OR ALTERED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF CONTECH. FAILURE TO COMPLY IS DONE AT THE USER'S OWN RISK AND CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR SUCH USE.

IF DISCREPANCIES BETWEEN THE SUPPLIED INFORMATION UPON WHICH THE DRAWING IS BASED AND ACTUAL FIELD CONDITIONS ARE ENCOUNTERED AS WORK PROGRESSES, THESE DISCREPANCIES MUST BE REPORTED TO CONTECH IMMEDIATELY FOR re-evaluation OF THE DESIGN. CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR ANY LOSS, INCLUDING, WITHOUT LIMITATION, LOSS OF USE, INCURRED AS A RESULT OF ERRONEOUS, INCOMPLETE OR INACCURATE INFORMATION SUPPLIED BY OTHERS.

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

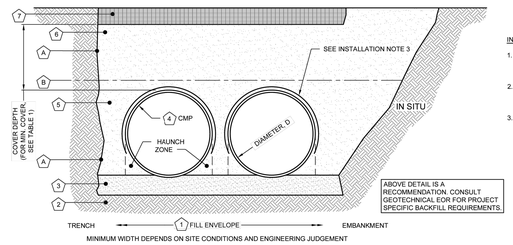
60"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 797134-010
ALTADENA MAIN LIBRARY
ALTADENA, CA
SITE DESIGNATION: CMP #1

PROJECT No.:	SEQ. No.:	DATE:
797134	010	5/15/2024
DESIGNED: EDMA	DRAWN: EDMA	
CHECKED: SJ	APPROVED: EDMA	
SHEET NO.: C2	OF 5	

TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2:

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING, WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.
- * APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

THE DESIGN AND INFORMATION SHOWN ON THIS DRAWING IS PROVIDED AS A SERVICE TO THE PROJECT OWNER, ENGINEER AND CONTRACTOR BY CONTECH ENGINEERED SOLUTIONS LLC ("CONTECH"). NEITHER THIS DRAWING NOR THE INFORMATION SHOWN HEREON MAY BE USED, REVISED OR ALTERED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF CONTECH. FAILURE TO COMPLY IS DONE AT THE USER'S OWN RISK AND CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR SUCH USE.

IF DISCREPANCIES BETWEEN THE SUPPLIED INFORMATION UPON WHICH THE DRAWING IS BASED AND ACTUAL FIELD CONDITIONS ARE ENCOUNTERED AS WORK PROGRESSES, THESE DISCREPANCIES MUST BE REPORTED TO CONTECH IMMEDIATELY FOR re-evaluation OF THE DESIGN. CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR ANY LOSS, INCLUDING, WITHOUT LIMITATION, LOSS OF USE, INCURRED AS A RESULT OF ERRONEOUS, INCOMPLETE OR INACCURATE INFORMATION SUPPLIED BY OTHERS.

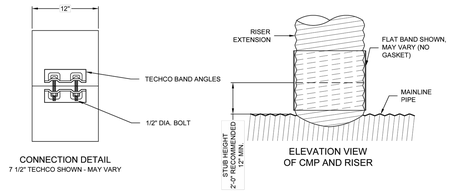
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

60"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 797134-010
ALTADENA MAIN LIBRARY
ALTADENA, CA
SITE DESIGNATION: CMP #1

PROJECT No.:	SEQ. No.:	DATE:
797134	010	5/15/2024
DESIGNED: EDMA	DRAWN: EDMA	
CHECKED: SJ	APPROVED: EDMA	
SHEET NO.: C3	OF 5	



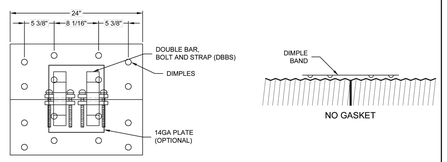
PLAIN END CMP RISER PIPE

GENERAL NOTES:

1. **DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.**
2. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
3. BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
4. IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
5. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1-PIECE
   - 54" 2-PIECES
6. ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
7. MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
8. DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

12" RISER BAND DETAIL

NOT TO SCALE



PLAIN END CMP PIPE

GENERAL NOTES:

1. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
2. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
3. BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1-PIECE
   - 54" THRU 96" 2-PIECES
   - 102" THRU 144" 3-PIECES
5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
6. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
7. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

D-24 DIMPLE BAND DETAIL

NOT TO SCALE

THE DESIGN AND INFORMATION SHOWN ON THIS DRAWING IS PROVIDED AS A SERVICE TO THE PROJECT OWNER, ENGINEER AND CONTRACTOR BY CONTECH ENGINEERED SOLUTIONS LLC ("CONTECH"). NEITHER THIS DRAWING NOR THE INFORMATION SHOWN HEREON MAY BE USED, REVISED OR ALTERED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF CONTECH. FAILURE TO COMPLY IS DONE AT THE USER'S OWN RISK AND CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR SUCH USE.

IF DISCREPANCIES BETWEEN THE SUPPLIED INFORMATION UPON WHICH THE DRAWING IS BASED AND ACTUAL FIELD CONDITIONS ARE ENCOUNTERED AS WORK PROGRESSES, THESE DISCREPANCIES MUST BE REPORTED TO CONTECH IMMEDIATELY FOR re-evaluation OF THE DESIGN. CONTECH EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR ANY LOSS, INCLUDING, WITHOUT LIMITATION, LOSS OF USE, INCURRED AS A RESULT OF ERRONEOUS, INCOMPLETE OR INACCURATE INFORMATION SUPPLIED BY OTHERS.

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

60"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 797134-010
ALTADENA MAIN LIBRARY
ALTADENA, CA
SITE DESIGNATION: CMP #1

PROJECT No.:	SEQ. No.:	DATE:
797134	010	5/15/2024
DESIGNED: EDMA	DRAWN: EDMA	
CHECKED: SJ	APPROVED: EDMA	
SHEET NO.: C4	OF 5	

1 CONTECH CMP DETAIL
NOT TO SCALE

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
STRUCTURAL
1041 S Garfield Avenue
Alhambra, CA 91801
Tel. 323.726.6098
Fax. 323.726.6043

STAMP



NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

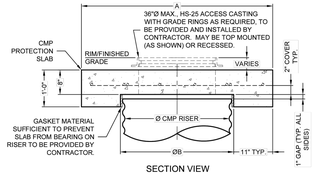
PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	

MISCELLANEOUS DETAILS

SCALE: As indicated

All drawings and written material herein constitute original published work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-5.1

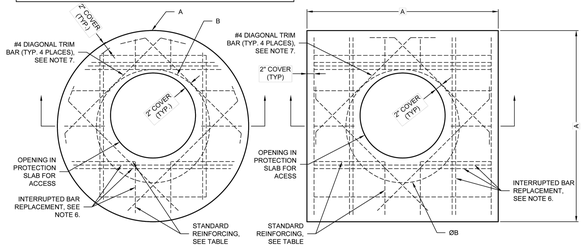


SECTION VIEW

REINFORCING TABLE				
Ø CMP RISER	A	B Ø	REINFORCING	**BEARING PRESSURE (PSF)
24"	4'Ø 4'x4'	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	4'-6"Ø 4'-6" x 4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,260 1,670
36"	5'Ø 5' x 5'	38"	#5 @ 9" OCEW #5 @ 8" OCEW	2,060 1,500
42"	5'-6"Ø 5'-6" x 5'-6"	44"	#5 @ 8" OCEW #5 @ 6" OCEW	1,490 1,370
48"	6'Ø 6' x 6'	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY

ACCESS CASTING NOT SUPPLIED BY CONTECH



ROUND OPTION PLAN VIEW

SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 4,000 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

MANHOLE CAP DETAIL
NOT TO SCALE

The design and information shown on this drawing is provided as an instrument of service for use solely with Contech Engineered Solutions LLC ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. Failure to comply is done at the user's own risk and Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which this drawing is based and actual field conditions are encountered as the work progresses, these discrepancies must be reported to Contech immediately for evaluation of the design. Contech cannot accept back charges or delaying claims unless adequate information is supplied to allow us to evaluate a condition in a timely manner.

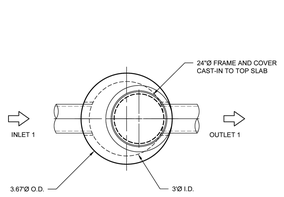
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

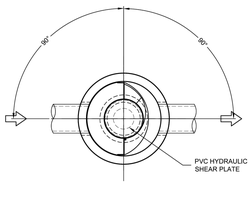
CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

60"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 797134-010
ALTADENA MAIN LIBRARY
ALTADENA, CA
SITE DESIGNATION: CMP #1

PROJECT No:	SEQ. No.	DATE
797134	010	5/15/2024
DESIGNED: EDMA	DRAWN: EDMA	
CHECKED: SJ	APPROVED: EDMA	
SHEET NO: C5 OF 5		



PLAN VIEW
INTERNALS NOT SHOWN



PLAN VIEW FOR PIPE ORIENTATION
TOP SLAB NOT SHOWN

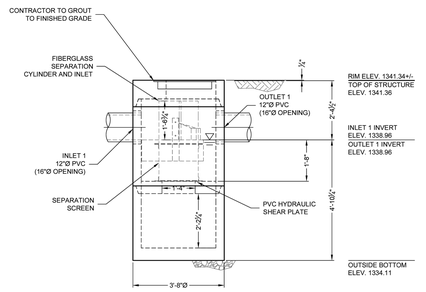
MATERIAL LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
1	1515-3 CONCENTRIC FIBERGLASS INSERT	CONTECH
1	1515, 4700 micron, 1.58' O.D. x 1.5' SCREEN, GREEN FLANGE UP	CONTECH
1	15 SERIES HARDWARE KIT	CONTECH
1	15 SERIES PVC HYDRAULIC SHEAR PLATE*	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	24"Ø X 4" FRAME AND COVER, EJ #41600309A01, NV, CAST-IN	CONTECH

* SEE HYDRAULIC SHEAR PLATE DETAIL

SITE DESIGN DATA

WATER QUALITY FLOW RATE	0.07 CFS
PEAK FLOW RATE	2.53 CFS
RETURN PERIOD OF PEAK FLOW	50 YRS



ELEVATION VIEW

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE, www.ContechES.com.
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 2500 LBS.
STRUCTURE IS DELIVERED IN 3 PIECES

MAX FOOTPRINT = 3.67'Ø

CONTECH CONTRACT DRAWING

RVRSD LAYOUT 1E

MARK	DATE	REVISION DESCRIPTION	BY

ALL RIGHTS RESERVED. COPYRIGHT © 2024 CONTECH ENGINEERED SOLUTIONS LLC. ALL RIGHTS RESERVED. THIS DRAWING IS PROTECTED UNDER COPYRIGHT LAWS AND IS THE EXCLUSIVE PROPERTY OF CONTECH ENGINEERED SOLUTIONS LLC. ANY REPRODUCTION, MODIFICATION, DISTRIBUTION, OR USE OF THIS DRAWING WITHOUT THE EXPRESS WRITTEN CONSENT OF CONTECH ENGINEERED SOLUTIONS LLC IS STRICTLY PROHIBITED. VIOLATORS WILL BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW.

CDS1515-3-C - 797134-15
ALTADENA MAIN LIBRARY
ALTADENA, CA
SITE DESIGNATION: CDS #1

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 8,061,763. RELATED FOREIGN PATENTS; OR OTHER PATENTS PENDING.

DATE:	5/15/2024
DESIGNED: EDMA	DRAWN: EDMA
CHECKED: SJ	APPROVED: EDMA
PROJECT No: 797134	SEQUENCE No: 15
SHEET: 1 OF 1	

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
1041 N Garfield Avenue
Pasadena, CA 91104
Tel. 323.726.8200
Fax. 323.726.8043

STAMP



NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	

MISCELLANEOUS DETAILS

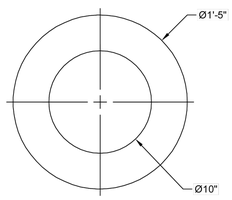
SCALE: As indicated

All drawings and written material herein constitute original work of the A/E of Anderson-Brulé Architects and may not be duplicated without the consent of Anderson-Brulé Architects. ©

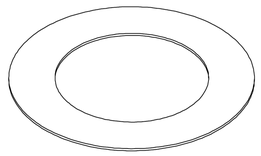
C-5.2

1 CONTECH CMP DETAIL (CONTINUED)
NOT TO SCALE

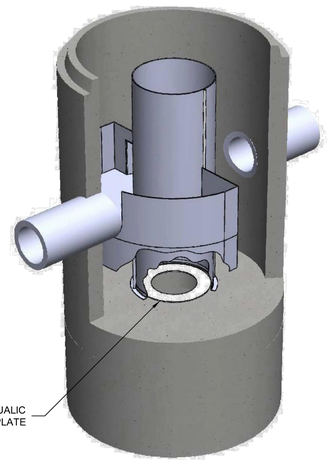
I:\COMMON\CAD\TREATMENT\22 CDS\44 FABRICATION\INTERNALS REFERENCE DETAILS\DWG\CDS 15 SERIES PVC HYDRAULIC SHEAR PLATE REF DETAIL.DWG 12/15/2022 9:42 AM



PLAN VIEW



ISOMETRIC VIEW



ELEVATION VIEW

- CONTECH WILL PROVIDE A PVC HYDRAULIC SHEAR PLATE IN ALL CDS UNITS WHICH HAVE A 1'-6" INSIDE DIAMETER SEPARATION SCREEN (15 SERIES)
- THE PRECASTER WILL PLACE THE HYDRAULIC SHEAR PLATE ON THE SEPARATION SLAB INSIDE THE SEPARATION SCREEN PRIOR TO SHIPPING THE CDS UNIT
- IF THE HYDRAULIC SHEAR PLATE SHIFTS DURING DELIVERY AND INSTALLATION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE IT IS CORRECTLY REPOSITIONED PRIOR TO INSTALLING THE TOP SLAB OF THE STRUCTURE
- THE HYDRAULIC SHEAR PLATE MUST REST ON THE SEPARATION SLAB INSIDE THE SEPARATION SCREEN
- THE HYDRAULIC SHEAR PLATE SHOULD LAY FLAT AND BE ABLE TO BE REMOVED FOR SYSTEM MAINTENANCE. DO NOT FASTEN TO SEPARATION SLAB FLOOR.

CDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 8,061,763. RELATED FOREIGN PATENTS; OR OTHER PATENTS PENDING.

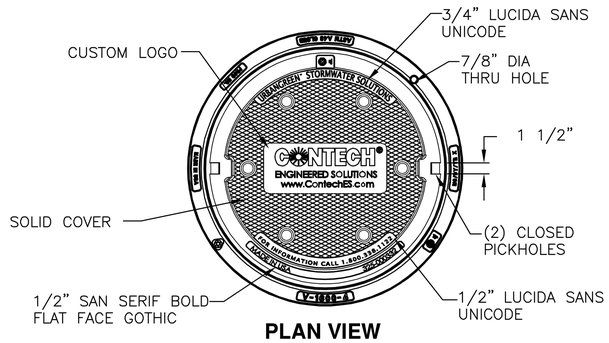
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS 15 SERIES
PVC HYDRAULIC SHEAR PLATE
REFERENCE DETAIL

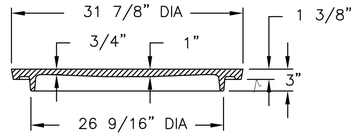
DATE: 12/15/22	SCALE: NONE	PROJECT No.: N/A	SEQUENCE No.: N/A	DRAWN: MBB	CHECKED: NDG

2 CDS PRETREATMENT UNIT DETAIL
NOT TO SCALE

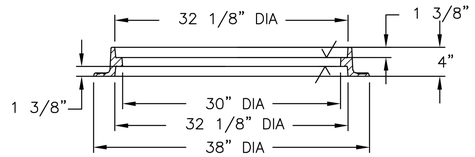
1810A4 V1600-4 Assembly



PLAN VIEW



COVER SECTION



FRAME SECTION

Product Number
001810119A02
Design Features
-Materials
Cover
Gray Iron (CL35B)
Frame
Gray Iron (CL35B)

-Load Rating
Heavy Duty
-Open Area
n/a
-Coating
Undipped
-✓ Designates Machined Surface

Certification
-
- ASTM A48
-
-Country of Origin: USA

Major Components
001810119
41600410

Drawing Revision
1/11/2022 Designer: MAH
1/12/2022 Revised By: MAH

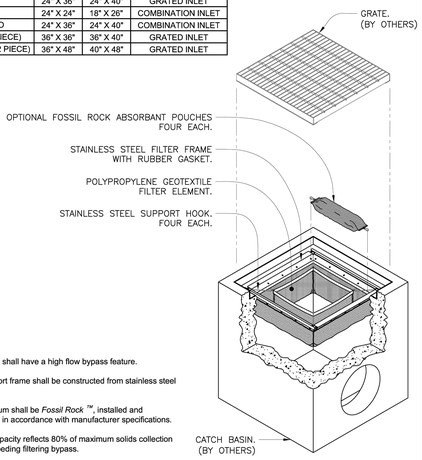
Disclaimer
Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

CONFIDENTIAL: This drawing is the property of EJ GROUP, Inc., and embodies confidential information, registered marks, patents, trade secret information, and/or know how that is the property of EJ GROUP, Inc. Copyright © 2012 EJ GROUP, Inc. All rights reserved.

Contact
800 626 4653
ejco.com

FG-0001

SPECIFIER CHART			
MODEL	INLET ID	GRATE OD	COMMENTS
FF-12D	12" X 12"	15" X 15"	GRATED INLET
FF-16D	16" X 16"	18" X 18"	GRATED INLET
FF-18D	18" X 18"	20" X 20"	GRATED INLET
FF-1836SD	18" X 36"	18" X 40"	GRATED INLET
FF-1836DGO	18" X 36"	18" X 40"	COMBINATION INLET
FF-24D	24" X 24"	26" X 26"	GRATED INLET
FF-2436SD	24" X 36"	24" X 40"	GRATED INLET
FF-24DGO	24" X 24"	18" X 26"	COMBINATION INLET
FF-2436DGO	24" X 36"	24" X 40"	COMBINATION INLET
FF-36D (2 PIECE)	36" X 36"	36" X 40"	GRATED INLET
FF-3648D (2 PIECE)	36" X 48"	40" X 48"	GRATED INLET



NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock ™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

Inlet Filtration

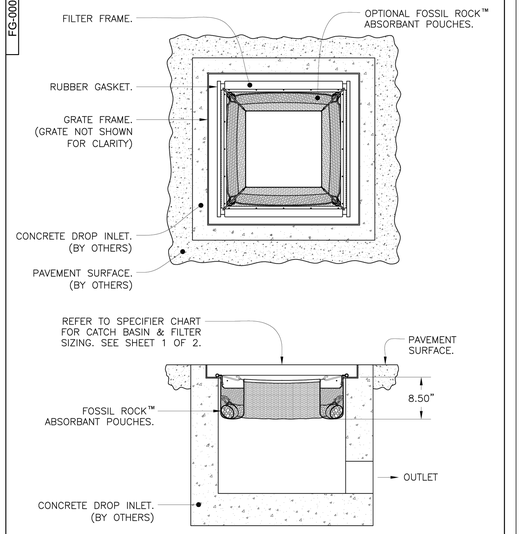
FloGard®
Catch Basin Insert Filter
Grated Inlet Style

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

THIS DOCUMENT IS THE PROPERTY OF OLDCASTLE PRECAST, INC. IT IS SUBMITTED FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE REPRODUCED OR USED FOR ANY PURPOSES OTHER THAN THAT FOR WHICH IT IS SUBMITTED BY OLDCASTLE PRECAST, INC. ALL RIGHTS RESERVED.

DRAWING NO.	REV.	ECO	DRAWN BY	DATE
FG-0001	E	ECO-0142	JPR 7/13/16	JPR 12/18/06 SHEET 1 OF 2

FG-0001



SECTION VIEW

Inlet Filtration

FloGard®
Catch Basin Insert Filter
Grated Inlet Style

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

THIS DOCUMENT IS THE PROPERTY OF OLDCASTLE PRECAST, INC. IT IS SUBMITTED FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE REPRODUCED OR USED FOR ANY PURPOSES OTHER THAN THAT FOR WHICH IT IS SUBMITTED BY OLDCASTLE PRECAST, INC. ALL RIGHTS RESERVED.

DRAWING NO.	REV.	ECO	DRAWN BY	DATE
FG-0001	E	ECO-0142	JPR 7/13/16	JPR 12/18/06 SHEET 2 OF 2

ZURN **Model 350DA**
Double Check Detector Assembly

Application
Designed for installation on water lines in fire protection systems to protect against both backsiphonage and backpressure of polluted water into the potable water supply. Model 350DA shall provide protection where a potential health hazard does not exist. Incorporates metered by-pass to detect leaks and unauthorized water use.

Standards Compliance
(Sizes 2 1/2" - 10" Horiz. & Vert.)
(12" Horizontal Only)
- ASSE® Listed 1048 (Sizes 2 1/2" thru 12")
- CSA® Certified B64.5 (Sizes 2 1/2" thru 8", & 12")
- AWWA Compliant C510 (Sizes 2 1/2" thru 12"), and C550
- UL® Classified (Sizes 2 1/2" thru 12")
- C-UL® Classified (Sizes 2 1/2" thru 12")
- FM® Approved (Sizes 2 1/2" thru 10")
- NYC MEA 147-99-M Vol 4 (2-1/2" - 10)
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California (Sizes 2 1/2" thru 12")
- Meets the requirements of NSF/ANSI/CAN 61* *(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

By-Pass Backflow Assembly 3/4" Model 950XLD

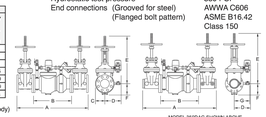
Materials

Main valve body	Ductile Iron ASTM A 536
Access covers	Ductile Iron ASTM A 536
Coatings	NSF Approved fusion epoxy finish
Internals	Stainless steel, 300 Series NORYL™
Fasteners	Stainless Steel, 300 Series
Elastomers	EPDM (FDA approved) Buna Nitrile (FDA approved)
Polymers	NORYL™
Springs	Stainless Steel, 300 Series

Dimensions & Weights (do not include pkg.)

MODEL 350ADA SIZE	WEIGHT: LESS SHUT-OFF VALVES		OS&Y GATE VALVES FLANGED		OS&Y GATE VALVES GROOVED		BUTTERFLY VALVES GROOVED	
in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
2 1/2	65	68	31	178	81	160	73	140	64
3	80	68	31	196	90	150	68	120	54
4	100	106	48	296	134	252	128	190	86
6	150	180	82	480	218	454	206	299	136
8	200	374	170	800	386	802	364	549	249
10	250	404	183	1222	554	1156	524	702	359
12	300	465	210	1623	736	n/a	n/a	n/a	n/a

Attention:
Model 350DA (flange body) and Model 350ADA (grooved body) have different lay lengths.



MODEL 350DA SIZE	DIMENSION (approximate): A		A WITH BUTTERFLY VALVES		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E WITH BUTTERFLY VALVES		F		G	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2 1/2	65	31	787	29	711	15 7/8	403	3 3/4	95	9	229	17 3/4	451	15 3/8	391	13 3/4	349	3 1/2	89	7 1/4	184
3	80	32	813	28 1/2	724	15 7/8	403	3 3/4	95	9	229	20 1/4	514	17	432	13 3/4	349	3 1/2	89	7 1/4	184
4	100	37 5/8	956	32 6/9	835	19 1/2	496	4 1/2	114	9	229	22 1/2	572	18 1/4	464	17	432	6	152	8	203
6	150	44 5/8	1133	37 5/8	956	23 1/2	597	8	152	10 1/2	267	30 1/2	775	24 1/4	616	17 1/2	445	7	178	10	254
8	200	60 7/8	1546	53 7/8	1369	37 3/4	959	10	254	12	305	37	940	28 1/2	724	16 15/16	430	8 1/2	216	11	279
10	250	63 7/8	1622	57 7/8	1470	37 3/4	959	10	254	12	305	45 5/8	1159	34 3/4	883	16 15/16	430	8 1/2	216	12	305
12	300	66 3/16	1681	n/a	n/a	38	965	10	254	12	305	53	1346	40 1/2	1029	n/a	n/a	8 7/8	226	16 3/4	425

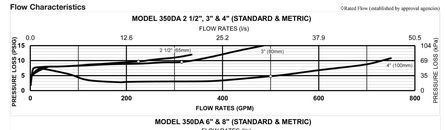
Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9676, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W8, 877-892-5216
www.zurn.com

Rev. G
Date: 9/22
Document No. BF-350DA
Product No.: Model 350DA
Patent zurn.com/patents

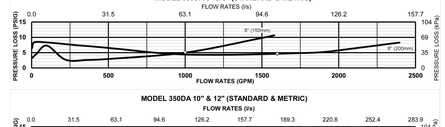
Page 1 of 2

Flow Characteristics
(Rated Flow (established by approval agencies))

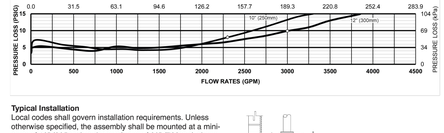
MODEL 350DA 2 1/2", 3" & 4" (STANDARD & METRIC)
FLOW RATES (l/s)



MODEL 350DA 6" & 8" (STANDARD & METRIC)
FLOW RATES (l/s)



MODEL 350DA 10" & 12" (STANDARD & METRIC)
FLOW RATES (l/s)



Options
(Suffixes can be combined)

☐	-	with OS & Y gate valves (standard)
☐ L	-	less shut-off valves (flanged body connections)
☐ LM	-	less water meter
☐	-	with gallon meter (standard)
☐ CFM	-	with cu ft meter
☐ CMM	-	with cu meter meter
☐ G	-	with groove end gate valves
☐ FG	-	with flanged inlet connection and grooved outlet connection
☐ PI	-	with Post Indicator Gate Valve
☐ GF	-	with flanged inlet connection and grooved outlet connection
☐ BG	-	with grooved end butterfly valves with integral monitor switches (2 1/2" - 10")

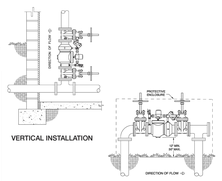
Accessories
☐ Repair kit (rubber only)
☐ Thermal expansion tank (Model XT)
☐ OS & Y Gate valve tamper switch (OSY-40)

Features
Sizes: 2 1/2", 3", 4", 6", 8", 10", 12"

Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections (Grooved for steel)	AWWA C606
(Flanged bolt pattern)	ASME B16.42 Class 150

Typical Installation
Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1763	2644	3525	5288

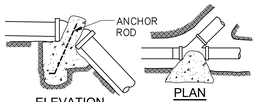


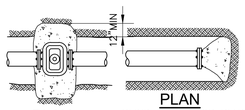
Specifications
The Double Check Detector Backflow Prevention Assembly shall be certified to NSF/ANSI/CAN 61, ASSE® Listed 1048, and supplied with full port gate valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536), the seat ring and check valve shall be Noryl™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The first and second check valves shall be accessible for maintenance without removing the device from the line. The Double Check Detector Backflow Prevention Assembly shall be a ZURN WILKINS Model 350DA.

Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9676, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W8, 877-892-5216
www.zurn.com

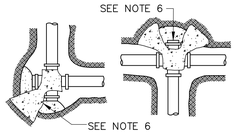
Page 2 of 2

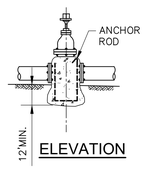
1 CATCH BASIN FILTER INSERT DETAIL
NOT TO SCALE

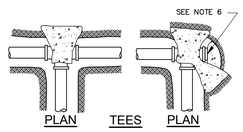


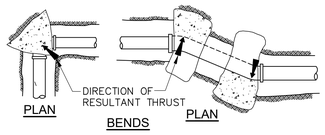


PLAN
BLIND FLANGE OR PLUG AT END OF WATERMAIN









GENERAL NOTES:

1. ALL ANCHOR AND THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED SOIL.
2. MINIMUM ALLOWABLE WATER PRESSURE FOR DESIGN OF THRUST BLOCKS IS 150 PSI. BEARING AREA INCREASE IN PRESSURE.
3. ALL CONCRETE USED IN THRUST BLOCKS SHALL ATTAIN 2000 PSI STRENGTH.
4. ALL ANCHOR RODS SHALL BE REINFORCING STEEL AND A MINIMUM OF 1/2–INCH IN DIAMETER.
5. USE ANCHOR BLOCKS AT VERTICAL BENDS WHEN PIPE IS ABOVE OR BELOW GROUND. SIZE OF BLOCK AND ROD SHALL BE AS SHOWN ON THE PLANS OR AS DETERMINED BY THE ENGINEER IN THE FIELD.
6. USE 30 POUND FELT TO INSURE COLD JOINT.
7. CONCRETE SHALL NOT COME INTO DIRECT WITH ASBESTOS CEMENT PIPE.
8. FOR PIPE 14" IN DIAMETER OR LARGER ENGINEER IS TO SUBMIT CALCULATIONS.

TABLE I

MINIMUM BEARING AREAS IN SQ.FT.				
MAIN SIZE	TEE	90° BEND	45° BEND	22 1/2° BEND
6"	4	4	4	3
8"	5	7	4	3

BASED ON 150 PSI W.W.R. PRESSURE & SOIL BEARING LOADS OF 2000 PSF THE RATIO OF WIDTH TO HEIGHT SHALL NOT EXCEED 1 1/2 TO 1

TEES,PLUGS,CAPS & HYDRANTS.

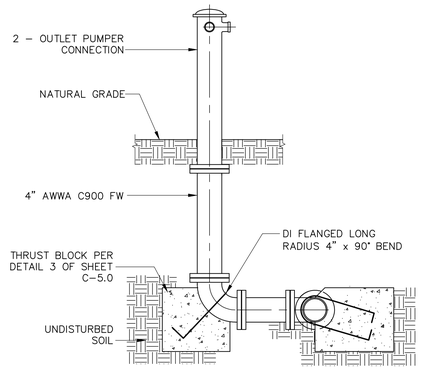
TABLE II

SOIL TYPE	MAX. ALLOWABLE SOIL BEARING VALUES	FACTORS FOR INCREASING AREAS IN TABLE 1
LOOSE SAND	500 PSF	4
SOFT SANDY CLAY	1000 PSF	2
ADOBE	1000 PSF	2
COMPACT FINE SAND	2000 PSF	1
COMPACT COARSE SAND	2000 PSF	1
MEDIUM STIFF CLAY	2000 PSF	1

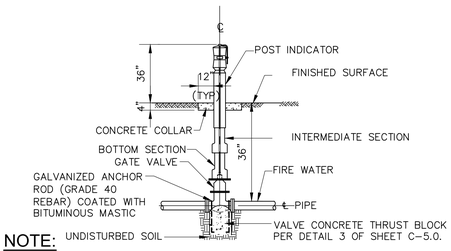
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE SAFE SOIL BEARING VALUES AND SIZE OF BEARING AREAS.

BASED ON 2 FEET MINIMUM DEPTH OF COVER OVER THE PIPE.

3 THRUST BLOCK DETAIL
NOT TO SCALE



4 FIRE DEPARTMENT CONNECTION DETAIL
NOT TO SCALE



NOTE:

1. POST INDICATOR VALVE TO BE PROTECTED WITH ABOVEGROUND BOLLARD / GUARD POSTS PER FIRE DEPARTMENT REQUIREMENTS.
2. POST INDICATOR VALVE, AMERICAN FLOW CONTROL IP–71, 4" MODEL 1A OR APPROVED EQUAL

5 POST INDICATOR VALVE DETAIL
NOT TO SCALE

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
CIVIL • STRUCTURAL
1001 S Stanford Avenue
Alhambra, CA 91801
Tel. 323.726.6008
Fax. 323.726.6043

STAMP

REGISTERED PROFESSIONAL ENGINEER — RONALD C. TSUJI — No. 38079 — Exp. 6/30/26 — CIVIL — STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

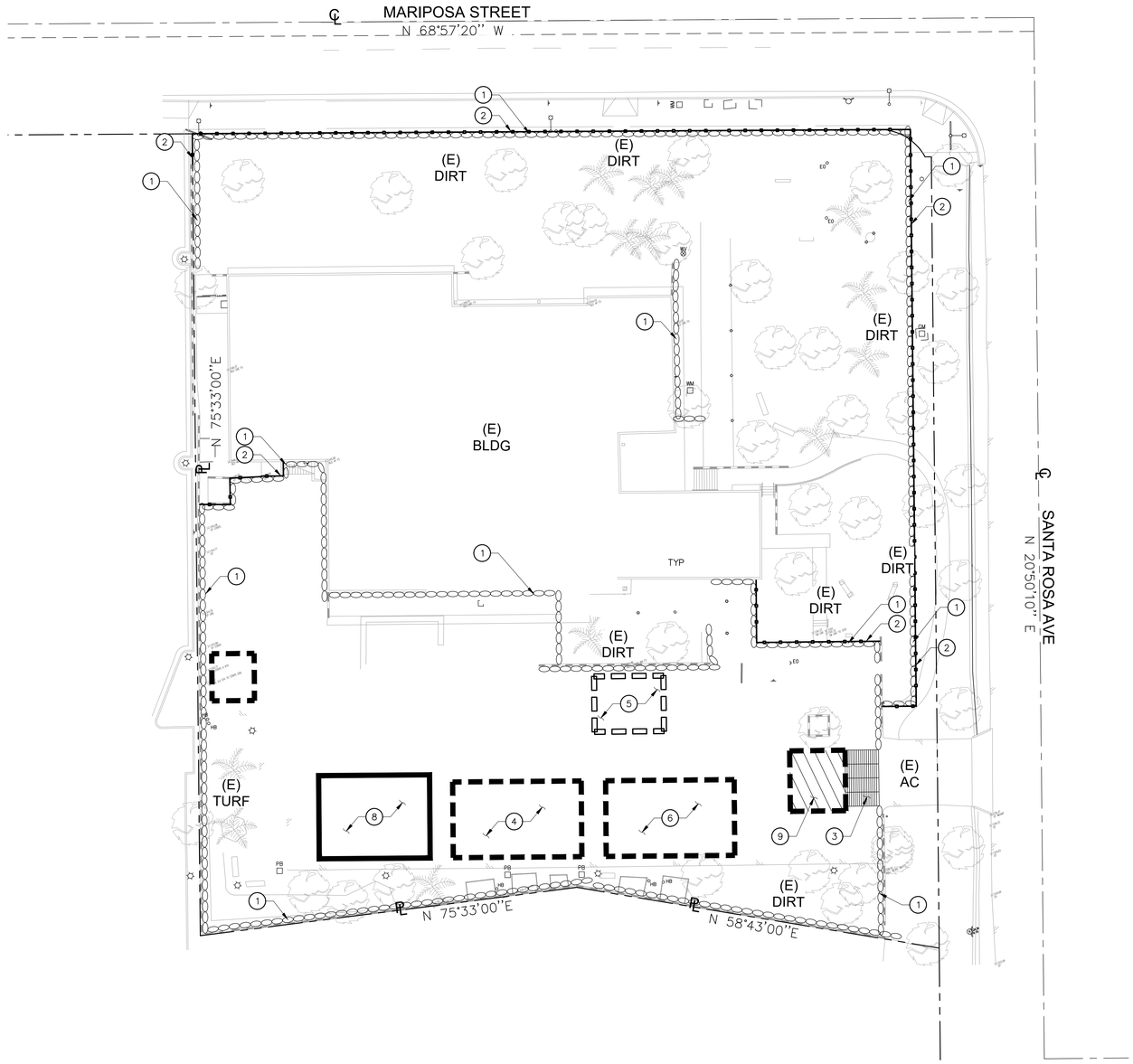
PROJECT NO. 2111010
DATE: 06-24-2024
SHEET TITLE:

MISCELLANEOUS DETAILS

SCALE: As indicated

All drawings and written material herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the consent of Anderson-Brulé Architects. ©

C-5.3



CONSTRUCTION NOTES:

1. INSTALL GRAVEL BAGS UNTIL THE COMPLETION OF THE SITE CONSTRUCTION. REFER TO DETAIL 2 ON SHEET C–6.1.
2. SILT FENCE PER DETAIL 5 ON SHEET C–6.1.
3. STABILIZED CONSTRUCTION ENTRANCE/EXIT PER DETAIL 4 ON SHEET C–6.1.
4. PROPOSED AREA FOR EQUIPMENT STAGING. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CONTRACTOR PROJECT MANAGER.
5. PROPOSED AREA FOR FUELING/OILING. CONTRACTOR TO VERIFY ACTUAL AREA NEEDED AND COORDINATE WITH THE CPM. REFER TO DETAIL 8 ON SHEET C–6.1.
6. PROPOSED AREA FOR LOADING. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CONTRACTOR PROJECT MANAGER.
7. PROPOSED AREA FOR TEMPORARY TOILETS. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CONTRACTOR PROJECT MANAGER.
8. PROPOSED AREA FOR VEHICLE AND EQUIPMENT CLEANING. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CONTRACTOR PROJECT MANAGER.
9. TIRE WASH PER DETAIL 6 ON SHEET C–6.1.

SHEET NOTES:

1. LOCATION FOR ANY DESIGNATED STOCKPILES SHALL BE COORDINATED AND DETERMINED BY THE CONTRACTOR ON–SITE. CONTRACTOR SHALL APPLY ALL APPLICABLE BMP'S TO PROTECT THE STOCKPILE AS OUTLINED IN DETAIL 7 ON SHEET C–6.1.
2. INSTALL 2" OF TEMPORARY CAB GRAVEL ON ALL ON–SITE CONSTRUCTION ROADWAYS TO STABILIZED AND CONTROL EROSION.
3. CONTRACTOR SHALL FROM TIME TO TIME MONITOR THE CONSTRUCTION SITE TO CLEAN AND SWEEP MATERIALS TRACKED OFF SITE.
4. ALL BMP'S, SILT FENCES, ETC., SHALL BE MONITORED AND MAINTAINED BY THE NTP1 CONTRACTOR FOR THE ENTIRE DURATION OF THE CONTRACT.
5. CONTRACTOR SHALL MONITOR WASTEWATER DISCHARGE (INCLUDING STORM RUNOFF) TO ENSURE IT MEETS STANDARDS SET BY APPROPRIATE LAWS, CODES, REGULATIONS, ORDINANCES AND PERMITS. PROVIDE A SETTLING BASIN AND OIL SEPARATOR PRIOR TO ITS DISCHARGE TO CITY OR COUNTRY SEWERS. PROVIDE A WATER SAMPLING STATION DOWNSTREAM OF BASIN FOR MONITORING OF WASTE WATER. DISPOSE OF WASTEWATER IN CLOSED CONDUITS SO AS NOT TO DAMAGE PUBLIC OR PRIVATE PROPERTY NOR CREATE A NUISANCE OR HEALTH HAZARD.
6. CONTRACTOR SHALL NOT DISCHARGE POLLUTANTS DOWNSTREAM OF THE SETTLING BASIN/OIL SEPARATOR. THESE POLLUTANTS INCLUDE LUBRICANTS, FUELS, CHEMICALS, AND BITUMENS. CONTROL USE OF LUBRICATING OILS, HYDRAULIC FLUIDS, GREASES, AND OTHER SUCH PRODUCTS. PROMPTLY CLEAN UP AND PROPERLY DISPOSE OF MATERIALS CONTAMINATED BY SPILLAGE OR LEAKAGE OF PRODUCTS.
7. THE CONTRACTOR SHALL MODIFY AS REQUIRED THE CURRENT APPROVED SWPPP/EROSION CONTROL PLANS FOR EACH PHASE OF THE PROJECT OR AS CONSTRUCTION ACTIVITIES PROGRESS THROUGH THE DURATION OF THE CONTRACT. THESE MODIFICATIONS SHALL BE REPORTED AND COORDINATED WITH BOTH THE QSD AND THE QSP. ANY MODIFICATIONS TO THE OVERALL DURATION OF CONSTRUCTION SCHEDULE FROM THAT AS SHOWN ON THE CURRENT SWPPP, SHALL ALSO BE REPORTED TO THE QSD. THE QSD SHALL THAN BE REQUIRED TO FILE AN EXTENSION OF CONSTRUCTION OR COI, (CHANGE OF INFORMATION), WITH THE STATE WATER RESOURCE CONTROL BOARD. ALL BMP'S SHALL BE MAINTAINED YEAR ROUND TO THE SATISFACTION OF THE QSD AND QSP.
8. CONTRACTOR SHALL PROTECT ALL EXISTING DRAIN INLETS WITHIN A 500–FT RADIUS FROM THE CENTER OF THE SITE TO PREVENT NON–STORMWATER RUNOFF FROM ENTERING THE STORM DRAIN SYSTEM.
9. FOR EROSION CONTROL GENERAL NOTES, AND MISCELLANEOUS REQUIREMENTS, SEE SHEET C–6.1.

EROSION CONTROL PLAN

20 10 0 20 40

SCALE: 1"=20

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC
CIVIL • MECHANICAL • PLUMBING
1041 S Garfield Avenue
Alhambra, CA 91801
Tel. 323.726.6066
Fax. 323.726.6045

STAMP



NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

EROSION CONTROL PLAN

SCALE: As indicated

All drawings and written materials herein constitute original unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

C-6.0

GENERAL NOTES:

1. IN CASE OF EMERGENCY, CALL: CONTRACTOR NAME _____. PHONE NUMBER: _____.
2. A STAND–BY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON (NOVEMBER 1 TO APRIL 15). NECESSARY MATERIALS SHALL BE AVAILABLE ON–SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF EMERGENCY DEVICES WHEN RAIN IS IMMINENT.
3. EROSION CONTROL DEVICES SHOWN ON THIS PLAN MAY BE REMOVED WHEN APPROVED BY THE BUILDING OFFICIAL IF THE GRADING OPERATION HAS PROGRESSED TO THE POINT WHERE THEY ARE NO LONGER REQUIRED.
4. GRADED AREAS ADJACENT TO FILL SLOPES LOCATED AT THE SITE PERIMETER MUST DRAIN AWAY FROM THE TOP OF SLOPE AT THE CONCLUSION OF EACH WORKING DAY. ALL LOOSE SOILS AND DEBRIS THAT MAY CREATE A POTENTIAL HAZARD TO OFF–SITE PROPERTY SHALL BE STABILIZED OR REMOVED FROM THE SITE ON A DAILY BASIS.
5. ALL SILT AND DEBRIS SHALL BE REMOVED FROM ALL DEVICES WITHIN 24 HOURS AFTER EACH RAINSTORM AND BE DISPOSED OF PROPERLY.
6. A GUARD SHALL BE POSTED ON SITE WHEREVER THE DEPTH OF WATER IN ANY DEVICE EXCEEDS TWO FEET. THE DEVICE SHALL BE DRAINED OR PUMPED DRY WITHIN 24 HOURS AFTER EACH RAINSTORM. PUMPING AND DRAINING OF ALL BASINS AND DRAINAGE DEVICES MUST COMPLY WITH THE APPROPRIATE BMP FOR DEWATERING OPERATIONS.
7. THE PLACEMENT OF ADDITIONAL DEVICES TO REDUCE EROSION DAMAGE AND CONTAIN POLLUTANTS WITHIN THE SITE IS LEFT TO THE DISCRETION OF THE QSP. ADDITIONAL DEVICES AS NEEDED SHALL BE INSTALLED TO RETAIN SEDIMENTS AND OTHER POLLUTANTS ON SITE.
8. DESILTING BASINS MAY NOT BE REMOVED OR MADE INOPERABLE BETWEEN NOVEMBER 1 AND APRIL 15 OF THE FOLLOWING YEAR WITHOUT THE APPROVAL OF THE BUILDING OFFICIAL.
9. STORM WATER POLLUTION AND EROSION CONTROL DEVICES ARE TO BE MODIFIED, AS NEEDED, AS THE PROJECT PROGRESSES, THE DESIGN AND PLACEMENT OF THESE DEVICES IS THE RESPONSIBILITY OF THE FIELD ENGINEER. PLANS REPRESENTING CHANGES MUST BE SUBMITTED FOR APPROVAL IF REQUESTED BY THE BUILDING OFFICIAL.
10. EVERY EFFORT MUST BE MADE TO ELIMINATE THE DISCHARGE OF NONSTORM WATER FROM THE PROJECT SITE AT ALL TIMES.
11. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ON–SITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND.
12. STOCKPILES OF EARTH AND OTHER CONSTRUCTION–RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.
13. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTINGS AND ARE NOT TO CONTAMINATE THE SOILS AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.
14. EXCESS OR WASTE CONCRETE MAY NOT BE WASTED INTO THE PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ON–SITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
15. DEVELOPERS/CONTRACTORS ARE RESPONSIBLE TO INSPECT ALL EROSION CONTROL DEVICES AND BMP's ARE INSTALLED AND FUNCTIONING PROPERLY IF THERE IS A 40% CHANCE OF 0.25 INCHES OR GREATER OF PREDICTED PRECIPITATION, AND AFTER ACTUAL PRECIPITATION. A CONSTRUCTION SITE INSPECTION CHECKLIST AND INSPECTION LOG SHALL BE MAINTAINED AT THE PROJECT SITE AT ALL TIMES AND AVAILABLE FOR REVIEW BY THE BUILDING OFFICIAL (COPIES OF SELF–INSPECTION CHECKLIST AND INSPECTION LOGS ARE AVAILABLE UPON REQUEST). AT HIS/HER EXPENSE THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A QUALIFIED SWPPP PRACTITIONER FOR THE DURATION OF THE PROJECT.
16. TRASH AND CONSTRUCTION–RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
17. SEDIMENTS AND OTHER MATERIALS MAY NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
18. ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.
19. AS THE ENGINEER OF RECORD, I HAVE SELECTED APPROPRIATE BMPs TO EFFECTIVELY MINIMIZE THE NEGATIVE IMPACTS OF THIS PROJECT'S CONSTRUCTION ACTIVITIES ON STORM WATER QUALITY. THE PROJECT OWNER AND CONTRACTOR ARE AWARE THAT THE SELECTED BMPs MUST BE INSTALLED, MONITORED, AND MAINTAINED TO ENSURE THEIR EFFECTIVENESS. THE BMPs NOT SELECTED FOR IMPLEMENTATION ARE REDUNDANT OR DEEMED NOT APPLICABLE TO THE PROPOSED CONSTRUCTION QUALITY."
20. THE FOLLOWING BMPs AS OUTLINED IN, BUT NOT LIMITED TO, THE "CALIFORNIA STORMWATER BEST MANAGEMENT PRACTICES HANDBOOK" – JANUARY 2003, OR THE LATEST REVISED EDITION, MAY APPLY DURING THE CONSTRUCTION OF THIS PROJECT (ADDITIONAL MEASURES MAY BE REQUIRED IF DEEMED APPROPRIATE BY THE PROJECT ENGINEER OR THE BUILDING OFFICIAL). _____ BUILDING OFFICIAL SIGNATURE

EROSION CONTROL

EC1 – SCHEDULING
EC2 – PRESERVATION OF EXISTING VEGETATION
EC3 – HYDRAULIC MULCH
EC4 – HYDROSEEDING
EC5 – SOIL BINDERS
EC6 – STRAW MULCH
EC7 – GEOTEXTILES AND MATS
EC8 – WOOD MULCHING
EC9 – EARTH DIKES AND DRAINAGE SWALES
EC10 – VELOCITY DISSIPATION DEVICES
EC11 – SLOPE DRAINS
EC12 – STREAMBANK STABILIZATION
EC13 – RESERVED
EC14 – COMPOST BLANKETS
EC15 – SOIL PREPARATION/ROUGHENING
EC16 – NON–VEGETATED STABILIZATION

TEMPORARY SEDIMENT CONTROL

SE1 – SILT FENCE
SE2 – SEDIMENT BASIN
SE3 – SEDIMENT TRAP
SE4 – CHECK DAM
SE5 – FIBER ROLLS
SE6 – GRAVEL BAG BERM
SE7 – STREET SWEEPING AND VACUUMING
SE8 – GRAVEL BAG BARRIER
SE9 – STRAW BALE BARRIER
SE10 – STORM DRAIN INLET PROTECTION
SE11 – ACTIVE TREATMENT SYSTEMS
SE12 – TEMPORARY SILT DIKE
SE13 – COMPOST SOCKS & BERMS
SE14 – BIOFILTERS BAGS

WIND EROSION CONTROL

WE1 – WIND EROSION CONTROL

EQUIPMENT TRACKING CONTROL

TC1 – STABILIZED CONSTRUCTION ENTRANCE EXIT
TC2 – STABILIZED CONSTRUCTION ROADWAY
TC3 – ENTRANCE/OUTLET TIRE WASH

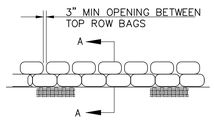
NON–STORMWATER MANAGEMENT

NS1 – WATER CONSERVATION PRACTICES
NS2 – DEWATERING OPERATIONS
NS3 – PAVING AND GRINDING OPERATIONS
NS4 – TEMPORARY STREAM CROSSING
NS5 – CLEARWATER DIVERSION
NS6 – ILLICIT CONNECTION/DISCHARGE
NS7 – POTABLE WATER/IRRIGATION
NS8 – VEHICLE AND EQUIPMENT CLEANING
NS9 – VEHICLE AND EQUIPMENT FUELING
NS10 – VEHICLE AND EQUIPMENT MAINTENANCE
NS11 – PILE DRIVING OPERATIONS
NS12 – CONCRETE CURING
NS13 – CONCRETE FINISHING
NS14 – MATERIAL AND EQUIPMENT USE
NS15 – DEMOLITION ADJACENT TO WATER
NS16 – TEMPORARY BATCH PLANTS

WASTE MANAGEMENT & MATERIAL POLLUTION CONTROL

WM1 – MATERIAL DELIVERY AND STORAGE
WM2 – MATERIAL USE
WM3 – STOCKPILE MANAGEMENT
WM4 – SPILL PREVENTION AND CONTROL
WM5 – SOLID WASTE MANAGEMENT
WM6 – HAZARDOUS WASTE MANAGEMENT
WM7 – CONTAMINATION SOIL MANAGEMENT
WM8 – CONCRETE WASTE MANAGEMENT
WM9 – SANITARY/SEPTIC WASTE MANAGEMENT
WM10 – LIQUID WASTE MANAGEMENT

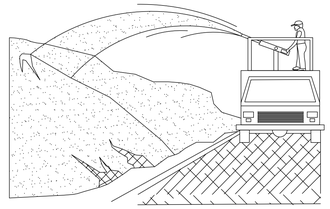
1 GENERAL NOTES





SECTION A-A

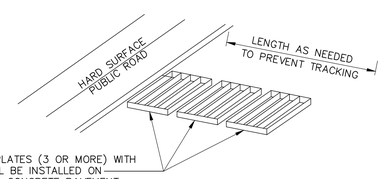
2 GRAVEL BAG DETAIL



NOTES:

1. SOIL/SLOPE STABILIZATION PRACTICES SHALL BE DESIGNED TO PRESERVE EXISTING VEGETATION WHERE FEASIBLE AND TO REVEGETATE OPEN AREAS AS SOON AS FEASIBLE AFTER GRADING. THESE CONTROL PRACTICES SHALL INCLUDE TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SOD STABILIZATION, VEGETATIVE BUFFER STRIPS, PROTECTION OF TREES, OR OTHER SOIL STABILIZATION PRACTICES.
2. SOIL STABILIZATION SHALL BE IMPLEMENTED ON ALL INACTIVE DISTURBED AREAS FROM NOVEMBER 1 THRU APRIL 15 AND ON ALL DISTURBED AREAS DURING A RAIN EVENT OR POTENTIAL RAIN.
3. STABILIZATION PRACTICES SHALL CONTROL/PREVENT EROSION FROM THE FORCES OF WIND AND WATER.
4. STABILIZATION PRACTICES SHALL BE IMPLEMENTED IN CONJUNCTION WITH SEDIMENT TRAPPING/FILTERING PRACTICES AND PRACTICES TO REDUCE THE TRACKING OF SEDIMENT ONTO PAVED ROADS.
5. WHEN USING STRAW MULCHING, THE MINIMUM APPLICATION SHALL BE 2 TONS/ACRE. MULCH MUST BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER.
6. WHEN USING HYDROSEEDING/MULCHING, THE MINIMUM APPLICATION OF WOOD FIBER SHALL BE 1,500 LBS/ACRE,THAT DOES NOT CONTAIN MORE THAN 50 PERCENT NEWSPRINT.
7. FOR SEEDING RECOMMENDATIONS, USDA, NATURAL RESOURCES CONSERVATION SERVICE.

3 EROSION CONTROL



NOTES:

1. SEDIMENTS AND OTHER MATERIALS SHALL NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS SHALL BE STABILIZED SO AS TO PREVENT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC ROADS. DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS INTO THE STORM DRAIN SYSTEM.
2. STABILIZED CONSTRUCTION ENTRANCE SHALL BE:

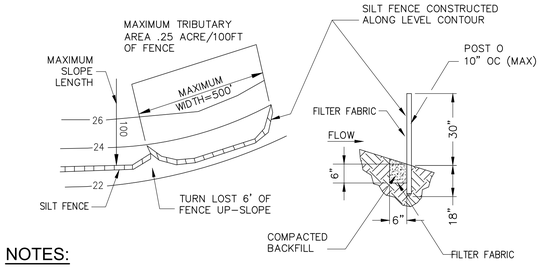
   A. LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE RD OR FROM A PUBLIC RIGHT OF WAY, STREET, ALLEY, AND SIDEWALK OR PARKING AREA.

   B. A SERIES OF STEEL PLATES WITH "RUMBLE STRIPS", AND/OR MIN 4" COARSE AGGREGATE WITH LENGTH, WIDTH & THICKNESS AS NEEDED TO ADEQUATELY PREVENT ANY TRACKING ONTO PAVED SURFACES.
3. ADDING A WASH RACK WITH A SEDIMENT TRAP LARGE ENOUGH TO COLLECT ALL WASH WATER CAN GREATLY IMPROVE EFFICIENCY.
4. ALL VEHICLES ACCESSING THE CONSTRUCTION SITE SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE SITES.

STREET MAINTENANCE

1. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS IMMEDIATELY.
2. SWEEP PAVED AREAS THAT RECEIVE CONSTRUCTION TRAFFIC WHENEVER SEDIMENT BECOMES VISIBLE.
3. PAVEMENT WASHING WITH WATER IS PROHIBITED IF IT RESULTS IN A DISCHARGE TO THE STORM DRAIN SYSTEM.

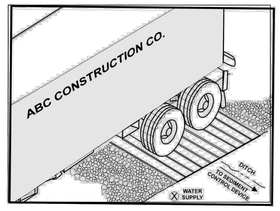
4 STABILIZED CONSTRUCTION ENTRANCE / EXIT



NOTES:

1. CONSTRUCT THE SILT FENCE ALONG A LEVEL CONTOUR.
2. SILT FENCES SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.
3. PROVIDE SUFFICIENT ROOM FOR RUNOFF TO POND BEHIND THE FENCE AND ALLOW SEDIMENT REMOVAL EQUIPMENT TO PASS BETWEEN THE SILT FENCE AND TOE OF SLOPE OR OTHER OBSTRUCTIONS. ABOUT 1200 SQ. FT. OF PONDING AREA SHALL BE PROVIDED FOR EVERY ACRE DRAINING TO THE FENCE.
4. TURN THE ENDS OF THE FILTER FENCE UPHILL TO PREVENT STORMWATER FROM FLOWING AROUND THE FENCE.
5. LEAVE AN UNDISTURBED OR STABILIZED AREA IMMEDIATELY DOWNSLOPE FROM THE FENCE.
6. DO NOT PLACE IN LIVE STREAM OR INTERMITTENTLY FLOWING CHANNELS.
7. WHEN STANDARD FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY–DUTY WIRE STAPLES AT LEAST 1 INCH LONG. TIE WIRES OR HOG RINGS.

5 SILT FENCE

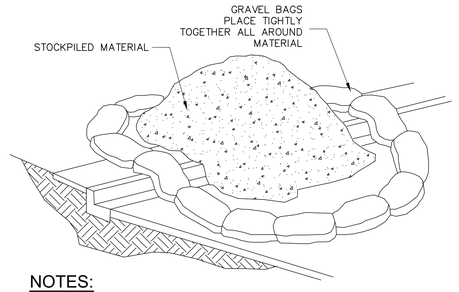


NOTES:

1. THE TIRE WASH REQUIRES A SUPPLY OF WASH WATER.
2. A TURNOUT OR DOUBLEWIDE EXIT IS REQUIRED TO AVOID HAVING ENTERING VEHICLES DRIVE THROUGH THE WASH AREA.
3. DO NOT USE WHERE WET TIRE TRUCKS LEAVING THE SITE LEAVE THE ROAD DANGEROUSLY SLICK.
4. INCORPORATE WITH A STABILIZED CONSTRUCTION ENTRANCE/EXIT.
5. CONSTRUCT ON LEVEL GROUND WHEN POSSIBLE, ON A PAD OF COARSE AGGREGATE GREATER THAN 3 IN. BUT SMALLER THAN 6 IN. A GEOTEXTILE
6. FABRIC SHOULD BE PLACED BELOW THE AGGREGATE.

   WASH RACK SHOULD BE DESIGNED AND CONSTRUCTED/MANUFACTURED FOR ANTICIPATED TRAFFIC LOADS.

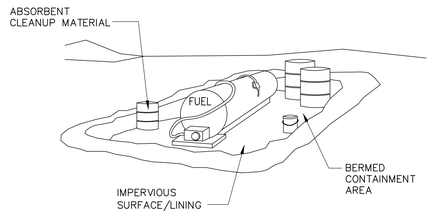
6 ENTRANCE/OUTLET TIRE WASH



NOTES:

1. DIRT AND OTHER CONSTRUCTION RELATED MATERIALS PLACED IN THE STREET OR ON OTHER IMPERVIOUS SURFACES MUST BE CONTAINED WITH SANDBAGS OR OTHER MEASURES TO PREVENT TRANSPORT TO THE STORMDRAIN SYSTEM.
2. ANY CONSTRUCTION MATERIAL STORED OR STOCKPILED ON–SITE SHALL BE PROTECTED FROM BEING TRANSPORTED BY THE FORCE OF WIND OR WATER.

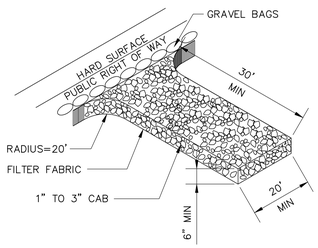
7 MATERIAL STORAGE
NOT TO SCALE



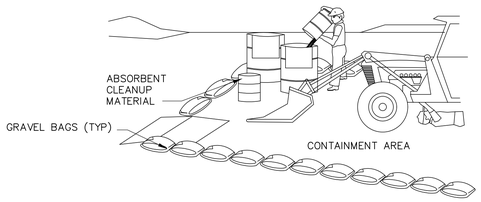
NOTE:

1. FUELING SHALL BE PERFORMED IN A DESIGNATED AREA, AWAY FROM COURSES. ABSORBENT CLEANUP MATERIAL SHALL BE ON SITE AND USED IMMEDIATELY IN THE EVENT OF A SPILL.

8 VEHICLE / EQUIPMENT FUELING



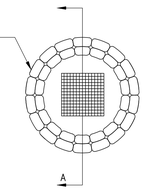
9 STABILIZED CONSTRUCTION ENTRANCE/EXIT
OPTIONAL BMP

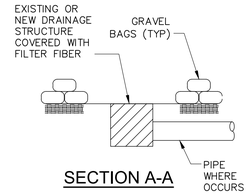


NOTES:

1. LEAKING VEHICLES AND EQUIPMENT SHALL NOT BE ALLOWED ON–SITE. EQUIPMENT AND VEHICLES SHALL BE INSPECTED FREQUENTLY FOR LEAKS AND SHALL BE REPAIRED IMMEDIATELY. CLEAN UP SPILLS AND LEAKS PROMPTLY WITH ABSORBENT; DO NOT FLUSH WITH WATER.
2. VEHICLES AND EQUIPMENT SHALL BE MAINTAINED AND REPAIRED ON–SITE ONLY IN DESIGNATED AREAS. PREVENT RUN–ON AND RUN–OFF FROM DESIGNATED AREAS. CONTAINMENT DEVICES SHALL BE PROVIDED AND AREAS SHALL BE COVERED IF NECESSARY.
3. DESIGNATE ON–SITE VEHICLE AND EQUIPMENT MAINTENANCE AREAS, WAY FROM STORM DRAIN INLETS AND WATERCOURSES.
4. ALWAYS USE SECONDARY CONTAINMENT, SUCH AS A DRAIN PAN OR DROP CLOTH, TO CATCH SPILLS AND LEAKS WHEN REMOVING OR CHANGING FLUIDS.
5. LEGALLY DISPOSE OF USED OILS, FLUIDS, AND LUBRICANTS.
6. PROVIDE SPILL CONTAINMENT DIKES OR SECONDARY CONTAINMENT AROUND STORED OIL, FUEL, AND CHEMICAL DRUMS.
7. MAINTAIN ON ADEQUATE SUPPLY OF ABSORBENT SPILL CLEANUP MATERIALS IN DESIGNATED AREA.

10 EQUIPMENT REPAIR/MAINTENANCE





SECTION A-A

11 GRAVEL BAG CHECKDAM
SCALE: NOT TO SCALE

OWNER STATEMENT OF UNDERSTANDING:

AS THE PROJECT OWNER OR AUTHORIZED AGENT OF THE OWNER, I HAVE READ AND UNDERSTAND THE REQUIREMENTS TO CONTROL STORM WATER POLLUTION FROM SEDIMENTS, EROSION, AND CONSTRUCTION MATERIALS, AND I CERTIFY THAT I WILL COMPLY WITH THESE REQUIREMENTS. I, OR MY REPRESENTATIVE, CONTRACTOR, DEVELOPER, OR ENGINEER, WILL MAKE CERTAIN THAT ALL BMP SHOWN ON THIS PLAN WILL BE FULLY IMPLEMENTED, AND ALL EROSION CONTROL DEVICES WILL BE KEPT CLEAN AND FUNCTIONING. PERIODIC INSPECTIONS OF THE BMPs WILL BE CONDUCTED AND A CURRENT LOG, SPECIFYING THE EXACT NATURE OF THE INSPECTION AND ANY REMEDIAL MEASURES, WILL BE KEPT AT THE CONSTRUCTION SITE AT ALL TIMES AND WILL BE AVAILABLE FOR THE REVIEW BY THE BUILDING OFFICIAL.

AS THE PROJECT OWNER OR AUTHORIZED AGENT OF THE OWNER, "I CERTIFY THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE INFORMATION SUBMITTED IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT SUBMITTING FALSE AND/OR INACCURATE INFORMATION, FAILING TO UPDATE THE LOCAL SWPPP TO REFLECT CURRENT CONDITIONS, OR FAILING TO PROPERLY AND/OR ADEQUATELY IMPLEMENT THE LOCAL SWPPP MAY RESULT IN REVOCATION OF GRADING AND/OR OTHER PERMITS OR OTHER SANCTIONS PROVIDED BY THE LAW."

_____ _____
OWNER OR AUTHORIZED REPRESENTATIVE (PERMITEE) DATE

12 STATEMENT OF UNDERSTANDING

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

MCA ENGINEERS, INC.
1001 S Bedford Avenue
Los Angeles, CA 90035
Tel. 323.726.8000
Fax. 323.729.6045

STAMP

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER C. KOSTER No. 56079 Exp. 12/30/26 CIVIL STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	

EROSION CONTROL DETAILS

SCALE: As indicated

All drawings and written material herein constitute original published work of Anderson-Brulé Architects and may not be duplicated without the consent of Anderson-Brulé Architects. ©

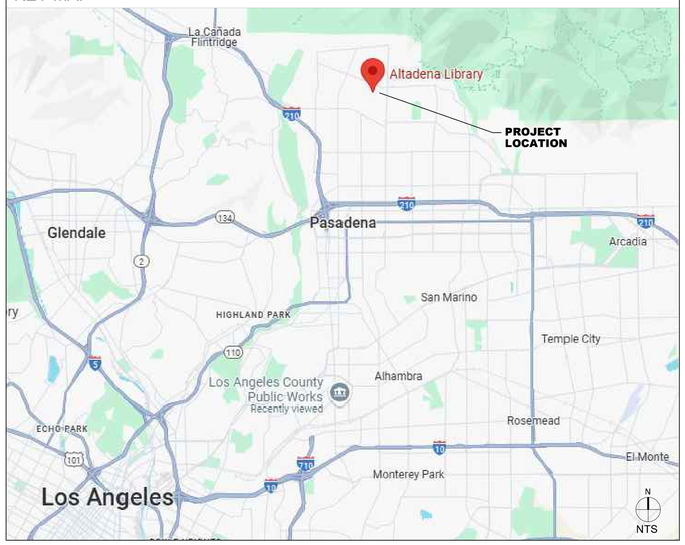
C-6.1

ALTADENA MAIN LIBRARY

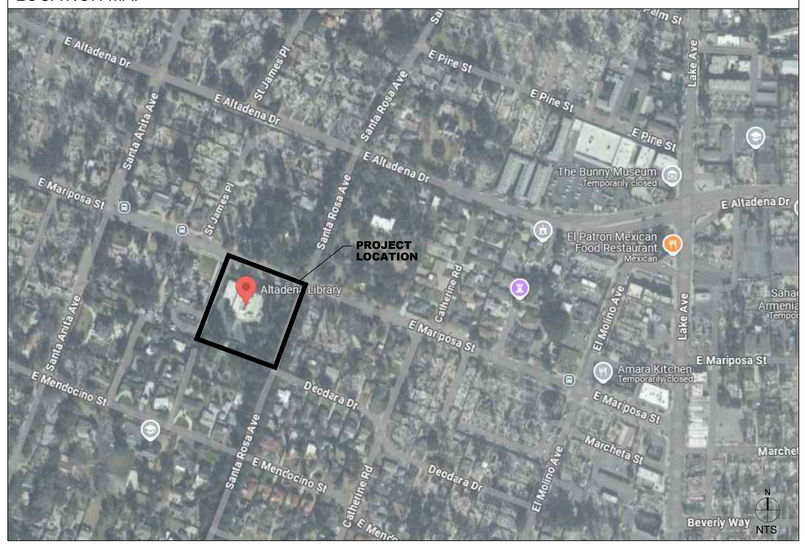
600 E Mariposa Street Altadena, CA, 91001

LANDSCAPE DRAWINGS

KEY MAP



LOCATION MAP



LANDSCAPE SHEET INDEX

REF.	DESCRIPTION
L000	LANDSCAPE TITLE SHEET
L001	LANDSCAPE DEMO AND TREE DISPOSITION PLAN
L002	ARBORIST REPORT
L101	SITE CONSTRUCTION PLAN
L102	SITE CONSTRUCTION PLAN
L110	SITE CONSTRUCTION DETAILS
L111	SITE CONSTRUCTION DETAILS
L112	SITE CONSTRUCTION DETAILS
L200	IRRIGATION PLAN
L210	IRRIGATION DETAILS
L211	IRRIGATION SCHEDULING
L300	PLANTING PLAN
L301	SOIL MANAGEMENT PLAN
L310	PLANTING DETAILS

PROJECT INFORMATION

ADDRESS:	600 E MARIPOSA STREET ALTADENA, CA 91001
ASSESSOR'S PARCEL NUMBER:	5840-010-900
ZONING DISTRICT:	R-1-10000
WATER PURVEYOR:	RUBIO CAÑON LAND & WATER ASSOCIATION 583 EAST SACRAMENTO ST. ALTADENA, CA 91001 626-797-0509
AVAILABLE WATER PRESSURE:	51 PSI

LANDSCAPE AND IRRIGATION MAINTENANCE BY PROPERTY OWNER (ALTADENA LIBRARY DISTRICT)

FUEL MODIFICATION

FUEL MODIFICATION PLAN IS **NOT** REQUIRED PER
LA COUNTY FIRE DEPARTMENT
FORESTRY DIVISION - FUEL MODIFICATION UNIT
590 S PARK AVE
POMONA, CA 91766
(626) 969-5205
CONTACT: IVAN CASTILLO

MWELO STATEMENT

"I AGREE TO COMPLY WITH THE REQUIREMENTS OF THE WATER EFFICIENT LANDSCAPE ORDINANCE AND SUBMIT A COMPLETE LANDSCAPE DOCUMENTATION PACKAGE."

BEN McCOY
CALIFORNIA LICENSED
LANDSCAPE ARCHITECT
LICENSE NUMBER: 6166
DATE: 2/13/25
ben@deptofspace.com
909-532-1460

TOTAL LANDSCAPED AREA UNDER THIS PROJECT SCOPE= 14,371 SF

STREET TREES WITHIN PUBLIC RIGHT-OF-WAY ARE TO BE PLANTED PER APPROVED STREET IMPROVEMENT

ALL HARDSCAPES, RETAINING WALLS, SWIMMING POOLS, AND/OR BLOCK WALLS MUST BE REVIEWED AND APPROVED UNDER A SEPARATE PERMIT

TREE CANOPIES ARE SHOWN AT FULL MATURITY

GENERAL PROJECT NOTES

1. ALL WORK TO BE PERFORMED SHALL MEET ALL LOCAL, STATE, AND FEDERAL CODES AND REGULATIONS AS WELL AS THE MOST CURRENT EDITION OF THE CALIFORNIA BUILDING CODE.
2. CONTRACTOR SHALL VISIT SITE AND REVIEW ALL CONDITIONS TO FULLY FAMILIARIZE THEMSELVES WITH THE PROJECT AND RELATED CONDITIONS
3. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR FOR SAFETY AND SAFETY STANDARDS DURING CONSTRUCTION.
4. CONTRACTOR SHALL CHECK, REVIEW, AND VERIFY ALL FIELD MEASUREMENTS WITH PROPOSED SCOPE OF WORK AND NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCY PRIOR TO STARTING OR CONTINUING ANY WORK.
5. CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL EXISTING CONSTRUCTION. ANY ITEMS TO REMAIN OR NOT IN SCOPE OF PROJECT LIMITS THAT IS DAMAGED OR INJURED, SHALL BE, AT CONTRACTORS' EXPENSE, REPLACED, REPAIRED OR REFINISHED TO "AS-IS" CONDITION PRIOR TO CONSTRUCTION OR DEMOLITION.
6. AT ALL TIMES, THE BUILDING, SITE, AND WORK AREA SHALL BE KEPT CLEAN, FREE OF DEBRIS AND ORDERLY. ALL DIRT, DEBRIS, WASTE, RUBBISH, AND DISUSED IMPLEMENTS AND EQUIPMENT SHALL NOT ACCUMULATE OVER A 24-HOUR PERIOD. FLAMMABLE AND/OR TOXIC MATERIALS SHALL NOT BE STORED IN PROJECT CONSTRUCTION STRUCTURES OR ADJACENT TO STRUCTURES.

ABBREVIATIONS

AC	ASPHALTIC CONCRETE	(N)	NEW
ACC	ACCESSIBLE	NIC	NOT IN CONTRACT
ALUM	ALUMINUM	OC	ON CENTER
BC	BOTTOM OF CURB	OFCI	OWNER FURNISHED, CONTRACTOR SUPPLIED
BS	BOTTOM OF STEP		
BW	BOTTOM OF WALL	PA	PLANTING AREA
CB	CATCH BASIN	PL	PROPERTY LINE
CBC	CALIFORNIA BUILDING CODE	POT	PATH OF TRAVEL
		QTY	QUANTITY
CLR	CLEARANCE	REF	REFERENCE
CJ	CONTROL JOINT	SIM	SIMILAR
CONC	CONCRETE	SCJ	SAWCUT CONTROL JOINT
CONT	CONTINUOUS		
DET	DETAIL	SD	STORM DRAIN
DIM	DIMENSION	STD	STANDARD
DWG	DRAWING	TC	TOP OF CURB
EA	EACH	TD	TOP OF DRAIN
EX	EXISTING	TS	TOP OF STEP
EJ	EXPANSION JOINT	TW	TOP OF WALL
ELEV	ELEVATION	TYP	TYPICAL
EQ	EQUAL	VIF	VERIFY IN FIELD
FG	FINISH GRADE	W/	WITH
FF	FINISH FLOOR	WWM	WELDED WIRE MESH
MTL	METAL		
MISC	MISCELLANEOUS		

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
BENJAMIN F. McCOY No. 6166
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25
SHEET TITLE:	

1

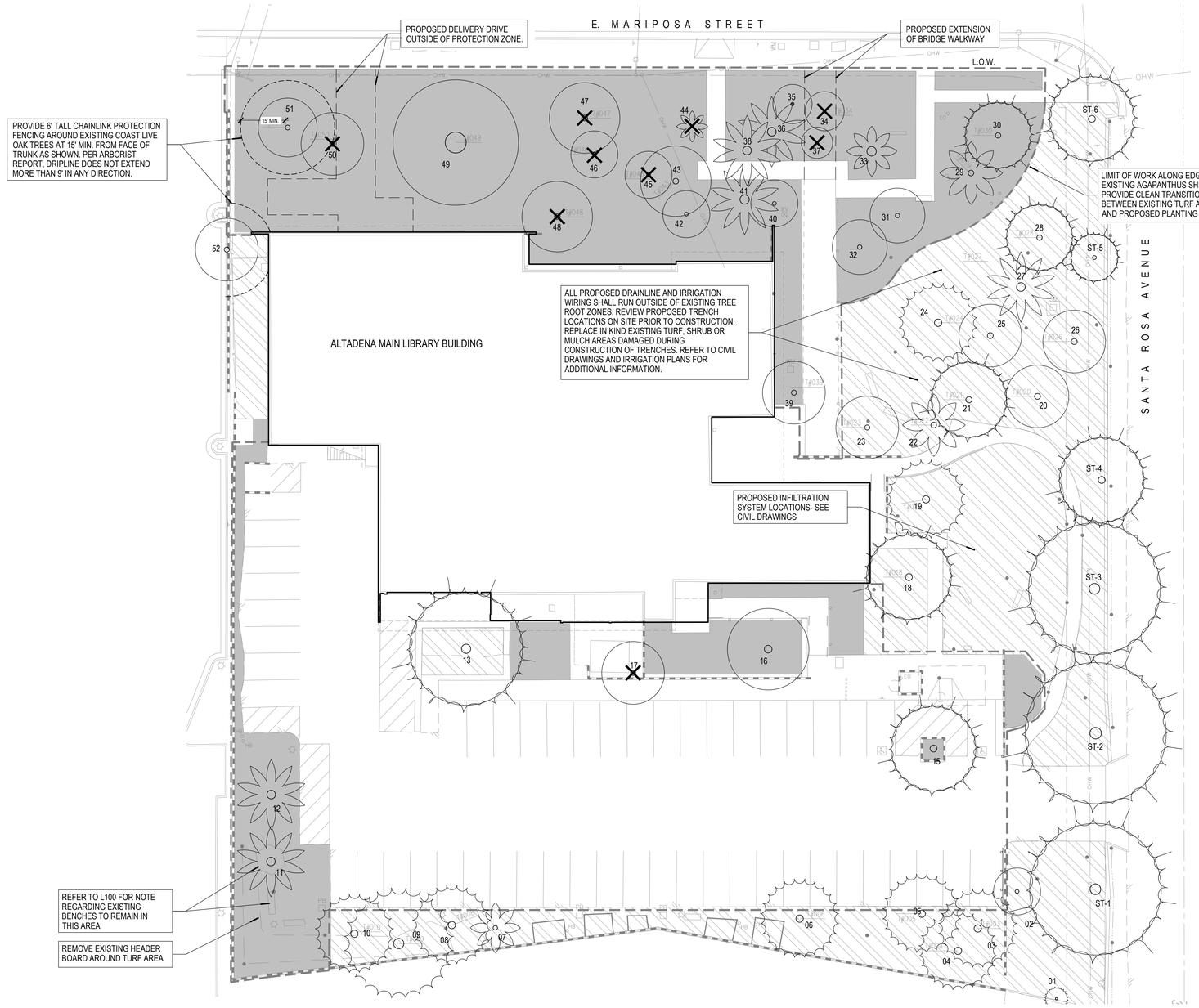
LANDSCAPE TITLE SHEET

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L000

7/18/2022 11:25:03 AM



LANDSCAPE DEMOLITION LEGEND

SYM.	DESCRIPTION
	EXISTING LANDSCAPE AREA TO REMAIN, PROTECT IN PLACE. MAINTAIN IRRIGATION DURING CONSTRUCTION THROUGH TEMPORARY ABOVE GROUND SYSTEM OR HAND WATERING. DO NOT DAMAGE EXISTING LANDSCAPE DURING CONSTRUCTION, OR PARK VEHICLES IN THIS AREA. GENERAL CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT IN KIND OF ALL PLANTING, IRRIGATION, OR UTILITY EQUIPMENT DAMAGED IN THIS AREA.
	EXISTING SHRUB AREA TO BE DEMOLISHED- CLEAR AND GRUB SO NO ORGANICS REMAIN. DO NOT DAMAGE ROOT STRUCTURE OF EXISTING TREES TO REMAIN.

TREE LEGEND

SYMBOL	DESCRIPTION	QTY.
X #	EXISTING TREE TO BE REMOVED, GRIND STUMP.	9
○ #	ALL TREES NOT INDICATED TO BE REMOVED SHALL BE PROTECTED IN PLACE. PROVIDE TREE PROTECTION PER NOTES BELOW.	48

REFER TO SHEET L002 FOR ARBORIST REPORT

TREE PROTECTION NOTES

1. THE GENERAL CONTRACTOR SHALL SUBMIT TO THE ARCHITECT AND LANDSCAPE ARCHTIECT A CONSTRUCTION FENCING PLAN FOR REVIEW AND APPROVAL. THE LOCATION OF CONSTRUCTION FENCING SHALL PROHIBIT ANY EARTHWORK, STAGING, OR PARKING OF HEAVY EQUIPMENT WITHIN THE PROTECTED ROOT ZONE (PRZ) OF THE EXISTING TREES TO REMAIN, BOTH INSIDE AND OUTSIDE THE LIMITS OF WORK FOR SITE IMPROVEMENTS. TO CALCULATE THE PRZ, MEASURE THE TREE'S DIAMETER (DBH) 4.5 FEET ABOVE THE GROUND IN INCHES. FOR EACH INCH, PROVIDE ONE FOOT OF PROTECTED AREA FROM THE OUTSIDE FACE OF THE TRUNK. FOR EXAMPLE IF A TREE'S DBH IS TEN INCHES, ITS PROTECTED ROOT ZONE EXTENDS 10' FROM THE FACE OF TRUNK AROUND THE TREE, WITH A DIAMETER OF 20'-10". SEE ARBORIST REPORT FOR DBH OF EXISTING TREES.
2. PROTECTIVE FENCING SHALL BE INSTALLED PRIOR TO ANY EARTHWORK AND UNTIL WORK IS COMPLETE. FENCING SHALL BE SIX FEET IN HEIGHT AND INSTALLED AT THE OUTER MOST EDGE OF THE CANOPY OR PROTECTED ROOT ZONE (PRZ) AT A MINIMUM. THE TEMPORARY FENCING SHALL BE CHAIN LINK FENCING OR OTHER APPROVED DURABLE MATERIAL. POST "TREE PROTECTION ZONE – KEEP OUT" SIGNS ON THE PRZ FENCING.
3. NO CONSTRUCTION OR STAGING EQUIPMENT IS ALLOWED WITHIN THE PROTECTED ROOT ZONE INCLUDING HEAVY EQUIPMENT THAT WILL COMPACT AND DAMAGE THE ROOTS.
4. NO DISPOSAL OF CONSTRUCTION MATERIALS OR BY PRODUCTS INCLUDING PAINT, PLASTER OR CHEMICAL SOLUTIONS IS ALLOWED WITHIN THE PROTECTED ROOT ZONE.
5. NATURAL OR PRECONSTRUCTION GRADE SHALL BE MAINTAINED WITHIN THE TREE PROTECTION ZONE. AT NO TIME SHALL SOIL BE IN CONTACT WITH THE TREE TRUNK ABOVE THE ROOT FLARE.
6. ALL EXISTING TREES TO REMAIN WITHIN AND OUTSIDE OF THE LIMIT OF WORK SHALL BE WATERED AS REQUIRED DURING THE CONSTRUCTION PERIOD.
7. ANY WORK REQUIRED TO BE CONDUCTED IN THE GROUND WITHIN THE PRZ SHALL BE ACCOMPLISHED WITH AN AIR SPADE TO MAKE ROOTS VISIBLE AND USE OF HAND TOOLS.
8. PRUNING FOR CLEARANCE, IF NEEDED, SHALL BE DONE TO PREVENT DAMAGING BRANCHES WITH LARGE EQUIPMENT. ALL PRUNING SHALL BE IN ACCORDANCE WITH INDUSTRY STANDARDS, (INTERNATIONAL SOCIETY OF ARBORICULTURE OR ANSI A300), UNDER THE DIRECTION OF A CERTIFIED ARBORIST.
9. A CERTIFIED ARBORIST SHALL BE PRESENT IF MORE THAN 33% OF THE ROOT ZONE IS IMPACTED OR ROOTS GREATER THAN 2" OR WITHIN 5' OF THE TRUNK WILL BE CUT, TO ENSURE TREE STABILITY AND HEALTH. CUTS SHOULD BE CLEAN AND MADE AT RIGHT ANGLES TO THE ROOTS. CUT ROOTS BACK TO A BRANCHING LATERAL.
10. PRUNING CUTS OR DAMAGED BARK SHALL BE CUT CLEAN TO HEAL. DO NOT USE TREE SEAL OR PAINT.
11. TRENCHES FOR PIPING OR UTILITIES SHALL NOT BE CONSTRUCTED WITH THE TREE PROTECTION ZONES BUT SHALL BE RE-ROUTED OR BORED UNDER TREES AT A MINIMUM OF 36" DEEP.
12. PROTECT SOIL AND ROOTS FROM COMPACTION IN LANDSCAPE AREAS USED FOR DRIVEWAYS, STORAGE OR PARKING WITH A LAYER OF GEOTEXTILE FABRIC AND 6" OF CRUSHED GRAVEL.

TREE REMOVAL LEGEND

TREE #	SPECIES	DBH	H / W	REASON FOR REMOVAL
17	*Pistacia chinensis* Chinese Pistache	11.5"	20' X 20'	In addition to being in poor health and planted directly against the maintenance shed and two 6' walls, this tree obscures the new proposed south building entry.
34	*Arbutus marina* Strawberry Tree	13" @ 1ft. (multi trunked)	25' X 17'	This tree obscures the new proposed bridge pathway connection. Per the arborist report it also suffers from crowded branching, a stripped center, and poor callus tissue formation.
37	*Arbutus marina* Strawberry Tree	5" @ 3ft. (multi trunked)	15' X 7'	This tree obscures the new proposed bridge pathway connection. Per the arborist report it also suffers from decline, canker damage at base, and is a candidate for removal due to bad health.
44	*Phoenix canariensis* Canary Island Date Palm	3ft. BT	5' X 15'	This is a very small tree with undesirable aesthetic impacts to the entry experience.
45	*Arbutus marina* Strawberry Tree	10" @ 1ft. (multi trunked)	20' X 17'	This tree obscures the new proposed north patio area. The arborist report mentions severe co-dominance and corwded branching.
46	*Arbutus marina* Strawberry Tree	8" @ 2ft. (multi trunked)	20' X 11'	This tree obscures the new proposed north patio area, and is a candidate for removal due to very poor health and structure.
47	*Jacaranda mimosifolia* Jacaranda	17"	40' X 25'	This tree has a severe lean of nearly 45 degrees and obscures the new proposed north patio area. In addition, the arborist report mentions exposed roots, poor trunk taper, and power line through canopy.
48	*Jacaranda mimosifolia* Jacaranda	15"	40' X 30'	Severely co dominant branches, circling roots, leaning south toward building, trunk buried, South canopy over structure, obscures development of North Patio
50	*Pittosporum tobira* Mock Orange	6", 8", 4", 6" (multi trunked)	20' X 14'	This tree obscures the path of the proposed Delivery drive.

EXISTING BOULDER NOTE

THE LANDSCAPE CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE EXISTING BOULDERS ON SITE. WITHIN THE LIMITS OF WORK EXIST APPROXIMATELY 22 BLACK LAVA ROCK BOULDERS 36" DIA. IN SIZE. APPROXIMATELY 8 BOULDERS NEED TO BE RELOCATED WITHIN THE PROPOSED PLANTING AREA TO PROVIDE ROOM FOR PROPOSED HARDSCAPE OR TURF AREAS. RELOCATED BOULDERS TO BE BURIED 1/3 INTO SOIL.

0' 8' 16' 32'
SCALE: 1" = 16'-0"

N

7/15/2022 11:26:03 AM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
ROBERT F. McCOY No. 6180
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 02-13-25

SHEET TITLE:

LANDSCAPE AND TREE DEMOLITION PLAN

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

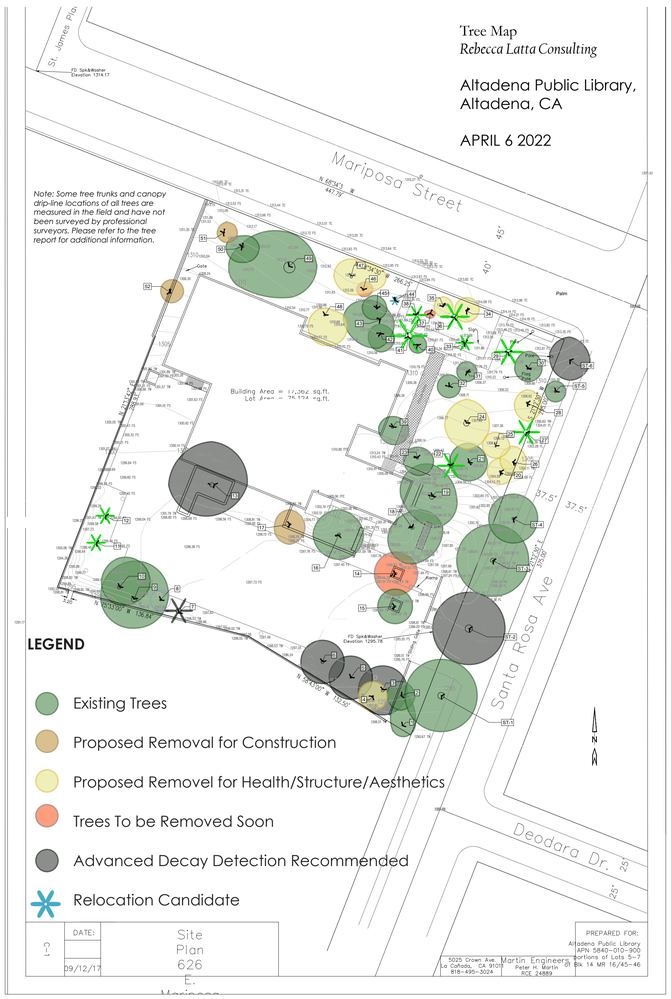
L001

ALTADENA LIBRARY DISTRICT
600 Mariposa Street Altadena CA 90110

#	Species	Common	DBH (in)	HxW	Health	Structure	N (')	W (')	S (')	E (')	Detail
1	*Cupressus sempervirens*	Italian Cypress	18.0	50x20	75	72	1	OP	OP	10	Storm damage, pruned for clearance, co-dominant main scaffold branches. Prune for structure if
2	*Pittosporum tobira*	Mock Orange	3,2.5, 2, 2, 3.5	18x20	78	75	10	10	10	10	Shrubs that have become trees
3	*Pinus canariensis*	Canary Island Pine	26.5	70x35	72	70	17	17	17	17	Crown raised to 25 ft. Epicormic growth, restructured after severe pruning event, foliage off color. Monitor yearly - stimulate root and shoot growth with low salt fertilizer and water
4	*Pinus canariensis*	Canary Island Pine	17.0	45x20	70	68	10	10	10	10	Crown raised to 20 ft. co-dominant structure, foliage off color, epicormic shoots. Monitor yearly, stimulate root growth with fertigation. May be a candidate for removal -health
5	*Pinus canariensis*	Canary Island Pine	23.0	70x30	73	72	15	15	15	15	Crown raised to 25 ft. Epicormic growth, restructured after severe pruning event, foliage off color. Monitor yearly - stimulate with low salt fertilizer and water
6	*Pinus canariensis*	Canary Island Pine	28.5	70x30	73	70	15	15	15	15	Crown raised to 25. Metal stake growing into tree, epicormic shoots, base of tree is swollen and sound hollow when struck with mallet. Advanced decay detection (sonic tomography) recommended.
7	*Phoenix canariensis*	Canary Island Date Palm	14' BT	20 x 20	75	75	10	10	10	10	20 live fronds, leaf bases shaped (wounds to trunk)
8	*Pinus canariensis*	Canary Island Pine	13.3	30x15	70	70	7	7	7	7	May be a candidate for removal - health. Suppressed by adjacent tree
9	*Pinus canariensis*	Canary Island Pine	40.5	60x50	75	80	30	25	20	12	Epicormic shoots, recovering from a hard prune, restructured. Foliage color good
10	*Pinus canariensis*	Canary Island Pine	28.0	65x35	75	75	21	12	15	19	Epicormic shoots, recovering from hard prune.
11	*Phoenix canariensis*	Canary Island Date Palm	25 ft BT	30x15	85	85	7	7	7	7	40 live fronds, memorial bench underneath
12	*Phoenix canariensis*	Canary Island Date Palm	20 ft BT	25 x 15	90	85	7	7	7	7	40 live fronds, memorial bench underneath
13	*Cedrus deodara*	Deodar Cedar	32.5	55x60	75	72	30	30	20	25	North side of tree is over structure. Soil very dry , thinning canopy, dieback on W (heat damage?) woodpecker damage. Fertigation recommended to improve shoot and root growth
14	*Cedrus deodara*	Deodar Cedar	20.0	25x30	69	70	15	15	15	15	Dieback, in decline, poor new shoot growth, raised in small planter with limited root area. Candidate for removal - health.
15	*Cedrus deodara*	Deodar Cedar	14.5	35x25	85	85	12	12	12	12	Circling roots, in small planter which it may eventually outgrow. Treat as potted. Water and fertilize
16	*Afrocarpus falcata*	African Fern Pine	24.8	35x30	80	80	17	18	17	17	In main planter near rear entry, rounded and raised.
17	*Pistacia chinensis*	Chinese Pistache	11.5	20x20	72	70	10	10	15	10	Suppressed. Adjacent to shed by rear. May need to be removed to construct new entry
18	*Cedrus deodora*	Deodar Cedar	27.3	55x32	75	75	11	19	21	25	Crown raised to 25 ft. pruned hard and restructured, epicormic shoots
19	*Pinus canariensis*	Canary Island Pine	43.0	70x20	75	70	23	19	17	22	Crown raised, pruned hard and restructured, epicormic shoots, woodpecker holes
20	*Cupaniopsis anacardioides*	Carrotwood	11.5	20x20	75	70	9	9	9	9	Rounded over, center stripped, reduced. Candidate for removal - aesthetic
21	*Cedrus deodora*	Deodar Cedar	13.0	35x25	78	78	12.5	13	13	13	Julius Shulman memorial tree with plaque, cleared to 8 ft from grade, top broken, new top establishing
22	*Washingtonia filifera*	California fan palm	27 ft BT	40x10	72	70	5	5	5	5	Pencilling, hourglass thinning, spike wounds mechanical damage, woodpecker nests? Remove - health?
23	*Heptapleurm calyptratum*	Tupidanthus	3.5, 4,3,6,6,5,5	15 x 20	75	72	7	10	12	11	Clump next to main library entry
24	*Pinus canariensis*	Canary Island Pine	40.0	55x35	75	75	18	15	18	16	Rounded and stubbed in previous hard pruning event, restructured, epicormic shoots, new shoot growth OK, monitor yearly for new growth, Water and fertilize. Removal candidate -aesthteic
25	*Cupaniopsis anacardioides*	Carrotwood	9.5	30x25	75	70	10	9	8	10	Rounded over, center stripped, reduced. Candidate for removal - aesthetic
26	*Cupaniopsis anacardioides*	Carrotwood	8.0	25x25	75	70	11	8	10	9	Rounded over, center stripped, reduced. Candidate for removal - aesthetic
27	*Phoenix canariensis*	Canary Island Date Palm	40 ft BT	45 x15	78	75	7	7	7	7	Pencilling, air roots, 40 live fronds, nests
28	*Pinus canariensis*	Canary Island Pine	18.0	50x20	75	75	9	8	14	10	Epicormic shoots. Candidate for removal - aesthetic
29	*Phoenix canariensis*	Canary Island Date Palm	20 ft BT	30 x 20	85	85	10	10	10	10	20 live fronds, growing at an angle on rocks
30	*Pinus canariensis*	Canary Island Pine	17.0	45x25	85	85	12	9	9	10	Healthy new growth
31	*Pistacia chinensis*	Chinese Pistache	7.5	15x20	75	75	7	7	7	5	Rounded over, 5 degree lean NW
32	*Pistacia chinensis*	Chinese Pistache	7.5	15x20	75	75	7	7	7	7	Rounded over, shortened
33	*Washingtonia robusta*	Mexican Fan Palm	30 ft BT	35x12	75	75	6	6	6	6	May be candidate for removal - aesthetic
34	*Arbutus marina*	Strawberry Tree	13 @1 ft	25x17	75	75	9	8	8	9	Crowded branching, center stripped, poor callus tissue formation
35	*Arbutus marina*	Strawberry Tree	9 @2ft	20x14	72	73	7	6	7	7	Mechanical damage to cambium layer, circling roots, crowded branches, seam of damage on bark,
36	*Phoenix canariensis*	Canary Island Date Palm	20 ft BT	20x20	78	78	10	10	10	10	Seedling trees in leaf bases on lower trunk where it is wet by sprinklers. Remove spray from trunk
37	*Arbutus marina*	Strawberry Tree	5 @ 3ft	15x7	70	70	0	4	4	3	Declining, canker damage at base. Candidate for removal - health
38	*Phoenix canariensis*	Canary Island Date Palm	35 ft BT	40x15	72	73	7	7	7	7	Signs of dieback in fronds, monitor for pink rot, remove sprinklers spray from trunk

ALTADENA LIBRARY DISTRICT
600 Mariposa Street Altadena CA 90110
4/22/2022

#	Species	Common	DBH (in)	HxW	Health	Structure	N (')	W (')	S (')	E (')	Detail
39	*Heptapleurm calyptratum*	Tupidanthus	5,5,7,9.5, 9	33x12	85	75	6	0	6	8	Near wall front planter facing Mariposa near building
40	*Pistache chinensis*	Chinese Pistache	7.5	20x13	80	75	6	6	6	7	Symmetrical, dominant, near front entry walk from Mariposa
41	*Phoenix canariensis*	Canary Island Date Palm	20 ft BT	30x20	90	90	10	10	10	10	Near sidewalk, remove sprinkler spray from trunk, seedling acorns growing on tree
42	*Arbutus marina*	Strawberry Tree	13 @2 ft	25x15	80	75	6	8	12	9	Suppressed, shortened, hummingbird feeder in tree
43	*Jacaranda mimosifolia*	Jacaranda	17.0	40x25	72	72	10	27	23	9	Co-dominant scaffolds, restructured after hard pruning, needs continued restructuring
44	*Phoenix canariensis*	Canary Island Date Palm	3ft BT	5x15	90	90	7	7	7	7	Too close to sidewalk? Young tree. Relocate? Awkward location
45	*Arbutus marina*	Strawberry Tree	10 @ 1 ft	20x17	80	70	9	10	7.5	7	Severely co-dominant, crowded branches, remove ivy. Prune for structure over time
46	*Arbutus marina*	Strawberry Tree	8 @ 2ft	20x11	70	70	5	5	4	7.5	Structural crack in main trunk. Candidate for removal - health/structure
47	*Jacaranda mimosifolia*	Jacaranda	17.0	40x24	75	73	12.5	12	10	24	Exposed roots, lean, poor trunk taper, power line through canopy. Removal candidate - aesthetic
48	*Jacaranda mimosifolia*	Jacaranda	15.0	40x30	75	73	5	9	21	13	Severely co dominant branches, circling roots, leaning S, trunk buried, South canopy over structure
49	*Olea europea*	Olive	10,8,13,9,17,25	35x45	90	75	24	24	21	19	Remove water spray on trunk, hole and decay on lower branch on NE, interior foliage stripped, Monitor yearly
50	*Pittosporum tobira*	Mock Orange	6,8,4,6	20x14	72	74	7.5	12	11	12	Canker on inside branch. Slow moving disease. Sterilize tools
51	*Quercus agrifolia*	Coast live oak	9.0	30x11	85	72	8	5.5	5.5	9	Poor taper, center stripped, string on trunk, prune for structure? Remove for new driveway?
52	*Quercus agrifolia*	Coast live oak	12 @1.5 ft	30x16	90	70	9	Oppl	7	9	Growing in fence, Remove for new driveway? Not a good relocation candidate
ST-1	*Cedrus deodara*	Deodar Cedar	38.0	60x50	75	75	24	21	26	26	Possible root damage on S, crown raised to 18 ft., stub cuts, circling root 1" in diameter could be cut. Lights and rigging in canopy
St-2	*Cedrus deodora*	Deodar Cedar	53.0	70x60	80	73	30	30	30	30	Severely co-dominant structure, potential for branch failure from weak attachment. Circling roots. Decay can be seen in lower scaffold branch. Driveway 10ft S, Walkway 15 ft W, Street on E. Lights and rigging in canopy
St-3	*Cedrus deodora*	Deodar Cedar	40.0	70x50	80	75	25	25	25	25	Circling roots, root uplift on sidewalk that has been patched, lights and rigging in canopy
St-4	*Cedrus deodara*	Deodar Cedar	33.5	70x34	80	80	17	17	17	17	Co-dominant scaffolds, lights and rigging
St-5	*Cedrus deodora*	Deodar Cedar	2.0	15x15	95	95	7	7	7	7	Young healthy tree
St-6	*Cedrus deodora*	Deodar Cedar	15.0	40x30	80	80	16	13	14	15	Trunk has bulging that may be decay, further testing is recommended, rigging and lights in tree



ARBORIST REPORT IS FOR REFERENCE ONLY, AND RECOMMENDATIONS SHOWN ARE PRELIMINARY. SEE SHEET L001 FOR TREE REMOVAL AND PROTECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
KENNETH F. McCOY
No. 6146
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 02-13-25
SHEET TITLE:

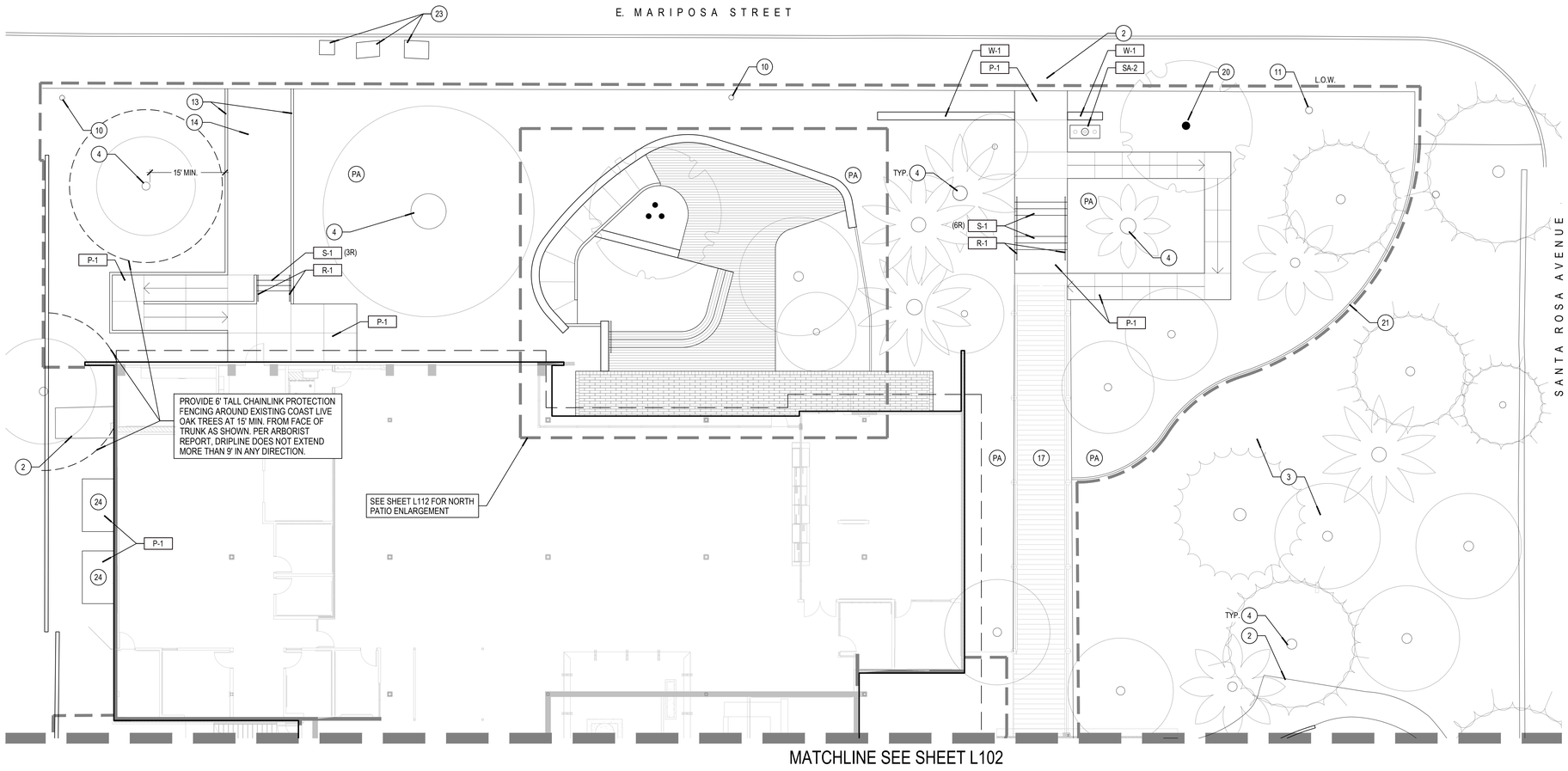
ARBORIST REPORT

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L002

7/18/2022 11:26:03 AM



MATCHLINE SEE SHEET L102

CONSTRUCTION LEGEND		
ITEM	DESCRIPTION	DETAIL
P-1	PEDESTRIAN CONCRETE PAVING- INTEGRAL COLOR DAVIS PEBBLE, LIGHT SAND FINISH, WITH SINAK HLQ-125 SEALANT	PER CIVIL
P-2	PRECAST CONCRETE PAVERS	06, 07 L111
P-3	TRUNCATED DOME PAVERS	08 / L111
S-1	CONCRETE STEPS	08 / L110
R-1	STEEL HANDRAIL AT STEPS	08 / L110
W-1	ENTRY SIGN WALL	02, 09 L110
W-2	STONE VENEER SEAT WALL	10 / L110
W-3	CONCRETE BLOCK PLANTER WALL	06 / L110
SA-1	BIKE RACKS- "CAPITOL" BY FORMS + SURFACES 800-451-0410, 3 RACKS = 6 SHORT TERM SPACES TOTAL	11 / L111
SA-2	FLAGPOLE PAD	10 / L111
SA-3	RAIN CHAIN DRAIN	09 / L111

CONSTRUCTION REFERENCE LEGEND	
ITEM	DESCRIPTION
1	FACE OF EXISTING BUILDING
2	EXISTING PAVING AREA TO REMAIN, MEET FLUSH, PROTECT IN PLACE (TYPICAL ALL ITEMS TO REMAIN)
3	EXISTING PLANTING AREA TO REMAIN, HAND WATER OR PROVIDE TEMPORARY IRRIGATION DURING CONSTRUCTION
4	EXISTING TREE TO REMAIN, SEE SHEET L001 FOR TREE PROTECTION NOTES
5	EXISTING CMU BLOCK WALL TO REMAIN, REFER TO SITE DEMOLITION PLAN FOR CUT LOCATION WHERE APPLICABLE
6	EXISTING LOW COBBLE WALL PORTION TO REMAIN, REFER TO SITE DEMOLITION PLAN FOR CUT LOCATION
7	EXISTING CONCRETE PLANTER BOX TO REMAIN
8	EXISTING WOOD BENCHES TO REMAIN, CLEAN AND RESEAL. REMOVE AND REINSTALL IN PLACE AS NEEDED TO INSTALL NEW IRRIGATION AND TURF.
9	EXISTING LIGHT POLE TO REMAIN
10	EXISTING UTILITY POLE TO REMAIN
11	EXISTING BANNER POLE TO REMAIN
12	RAISED DECK PER ARCHITECT
13	CURB PER CIVIL, MATCH P-1 COLOR AND FINISH
14	ASPHALT PAVING (NEW OR RESURFACED) PER CIVIL
15	RECESSSED WALK OFF GRILL- REFER TO ARCHITECTURAL DRAWINGS
16	ACCESSIBLE RAMP- REFER TO CIVIL DRAWINGS
17	WOOD BRIDGE PER ARCHITECT
18	STORMWATER INFILTRATION SYSTEM- REFER TO CIVIL DRWAINGS
19	ELECTRICAL VEHICLE CHARGING STATION
20	PROPOSED TREE- SEE PLANTING PLAN
21	PROPOSED LANDSCAPE EDGING- SEE PLANTING PLAN
22	NEW BOOK DROPOFF- OFCI
23	EXISTING BOOK DROP CONTAINERS (3), RELOCATED AND SURFACE MOUNTED, PATCH PAVING AS NEEDED AT ORIGINAL LOCATION
24	PAD LOCATION FOR OFCI 5' X 10' MAINTENANCE SHED
PA	PROPOSED PLANTING AREA- SEE PLANTING PLAN

CONSTRUCTION NOTES

1. VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO START OF WORK, CALL DIGALERT 811.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, GRADES, EXISTING STRUCTURES, AND FIELD CONDITIONS AT THE SITE BEFORE COMMENCING WORK. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT OF ANY DISCREPANCIES.
3. TYPICAL DETAILS SHALL APPLY IN GENERAL CONSTRUCTION WHERE NO DETAILS ARE GIVEN. OMISSIONS, AND/OR FIELD CONDITIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT BEFORE PROCEEDING WITH WORK.
4. ENSURE THAT IRRIGATION SLEEVING, DRAINLINES, ELECTRICAL CONDUITS, SLEEVES, ETC. ARE IN PLACE PRIOR TO INSTALLATION OF PAVING AND WALLS.
5. CONTRACTOR SHALL MAKE NO MATERIAL SUBSTITUTIONS UNLESS APPROVED BY LANDSCAPE ARCHITECT.

MOCKUPS AND SUBMITTALS

ALL SAMPLES AND MOCKUPS TO BE REVIEWED AND APPROVED BY LANDSCAPE ARCHTIECT AND/OR OWNER'S REPRESENTATIVE PRIOR TO COMPLETING CONSTRUCTION. PREPARE PRELIMINARY MOCKUPS ON SITE TO REVIEW DURING 4 SITE VISITS MAXIMUM. ALLOW FOR CHANGES IN COLOR/FINISH SPECIFICATION FOR MATERIALS OF EQUAL COST PRIOR TO MOCKUP APPROVAL.

1. CONCRETE PAVING P-1:
   PROVIDE UP TO THREE 4'X4' MOCKUPS WITH JOINTS SHOWN.
2. PRECAST CONCRETE PAVERS:
   PROVIDE 4 FULL SIZE PAVERS FOR REVIEW ADJACENT TO CONCRETE PAVING MOCKUP
3. WOOD DECKING:
   SUBMIT CUT SHEETS FOR ALL MATERIALS INCLUDING COLOR AND FINISHES
   REVIEW 4'X4' MINIMUM MOCKUP IN PLACE
4. CONCRETE BLOCK PLANTER WALL:
   REVIEW MOCKUP IN PLACE, 4' LONG MINIMUM
5. STONE SEATWALL:
   REVIEW MOCKUP IN PLACE, 4' LONG MINIMUM

SCALE: 1" = 10'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
ELIZABETH F. McCOY No. 6140
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

SHEET TITLE:

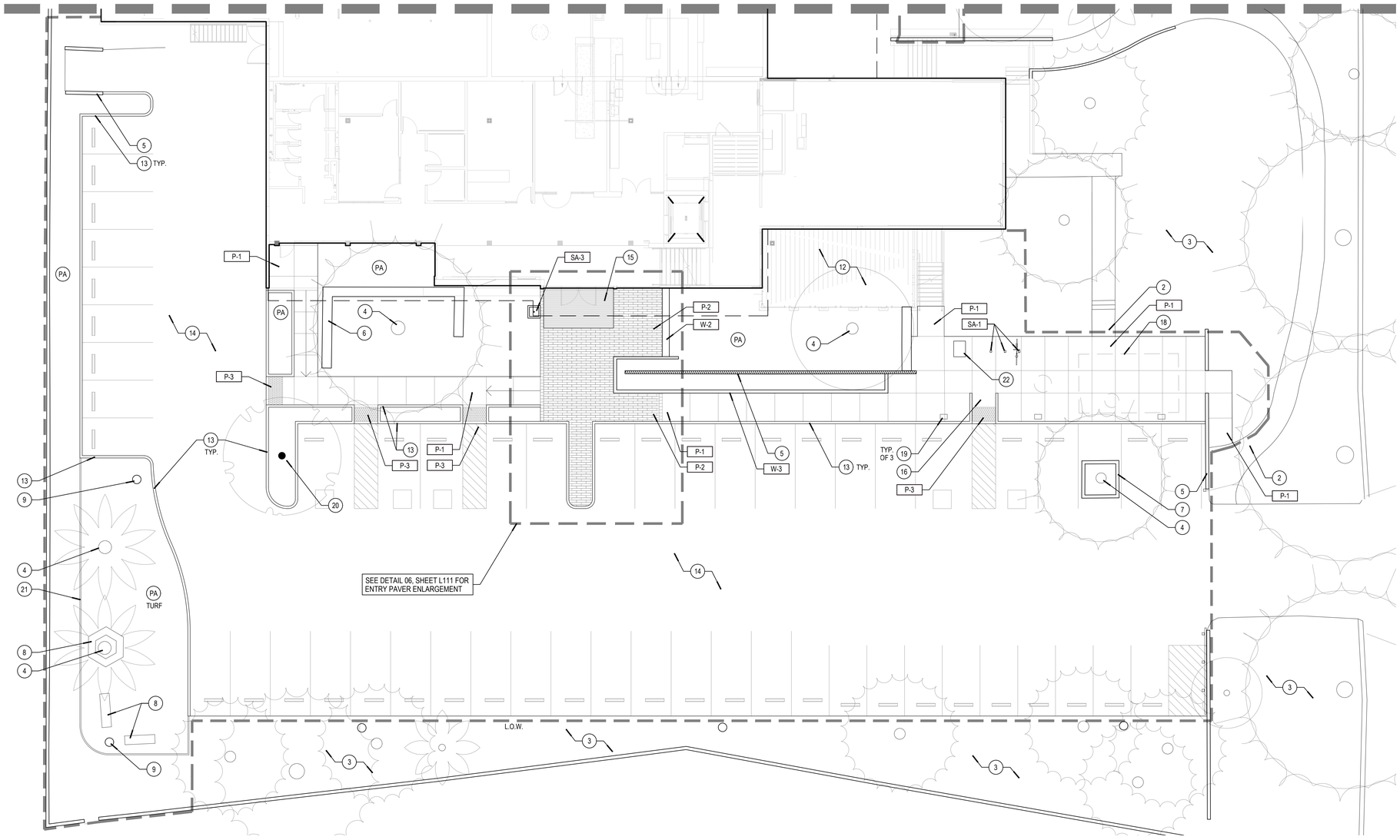
SITE CONSTRUCTION PLAN

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L101

7/18/2022 11:25:03 AM



CONSTRUCTION LEGEND		
ITEM	DESCRIPTION	DETAIL
P-1	PEDESTRIAN CONCRETE PAVING- INTEGRAL COLOR DAVIS PEBBLE, LIGHT SAND FINISH, WITH SINAK HLQ-125 SEALANT	PER CIVIL
P-2	PRECAST CONCRETE PAVERS	06, 07 L111
P-3	TRUNCATED DOME PAVERS	08 / L111
S-1	CONCRETE STEPS	08 / L110
R-1	STEEL HANDRAIL AT STEPS	08 / L110
W-1	ENTRY SIGN WALL	02, 09 L110
W-2	STONE VENEER SEAT WALL	10 / L110
W-3	CONCRETE BLOCK PLANTER WALL	06 / L110
SA-1	BIKE RACKS- "CAPITOL" BY FORMS + SURFACES 800-451-0410, 3 RACKS = 6 SHORT TERM SPACES TOTAL	11 / L111
SA-2	FLAGPOLE PAD	10 / L111
SA-3	RAIN CHAIN DRAIN	09 / L111

CONSTRUCTION REFERENCE LEGEND	
ITEM	DESCRIPTION
1	FACE OF EXISTING BUILDING
2	EXISTING PAVING AREA TO REMAIN, MEET FLUSH, PROTECT IN PLACE (TYPICAL ALL ITEMS TO REMAIN)
3	EXISTING PLANTING AREA TO REMAIN, HAND WATER OR PROVIDE TEMPORARY IRRIGATION DURING CONSTRUCTION
4	EXISTING TREE TO REMAIN, SEE SHEET L001 FOR TREE PROTECTION NOTES
5	EXISTING CMU BLOCK WALL TO REMAIN, REFER TO SITE DEMOLITION PLAN FOR CUT LOCATION WHERE APPLICABLE
6	EXISTING LOW COBBLE WALL PORTION TO REMAIN, REFER TO SITE DEMOLITION PLAN FOR CUT LOCATION
7	EXISTING CONCRETE PLANTER BOX TO REMAIN
8	EXISTING WOOD BENCHES TO REMAIN, CLEAN AND RESEAL. REMOVE AND REINSTALL IN PLACE AS NEEDED TO INSTALL NEW IRRIGATION AND TURF.
9	EXISTING LIGHT POLE TO REMAIN
10	EXISTING UTILITY POLE TO REMAIN
11	EXISTING BANNER POLE TO REMAIN
12	RAISED DECK PER ARCHITECT
13	CURB PER CIVIL, MATCH P-1 COLOR AND FINISH
14	ASPHALT PAVING (NEW OR RESURFACED) PER CIVIL
15	RECESSSED WALK OFF GRILL- REFER TO ARCHITECTURAL DRAWINGS
16	ACCESSIBLE RAMP- REFER TO CIVIL DRAWINGS
17	WOOD BRIDGE PER ARCHITECT
18	STORMWATER INFILTRATION SYSTEM- REFER TO CIVIL DRWAINGS
19	ELECTRICAL VEHICLE CHARGING STATION
20	PROPOSED TREE- SEE PLANTING PLAN
21	PROPOSED LANDSCAPE EDGING- SEE PLANTING PLAN
22	NEW BOOK DROPOFF- OFCI
23	EXISTING BOOK DROP CONTAINERS (3), RELOCATED AND SURFACE MOUNTED, PATCH PAVING AS NEEDED AT ORIGINAL LOCATION
24	PAD LOCATION FOR OFCI 5' X 10' MAINTENANCE SHED
PA	PROPOSED PLANTING AREA- SEE PLANTING PLAN

CONSTRUCTION NOTES

1. VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO START OF WORK, CALL DIGALERT 811.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, GRADES, EXISTING STRUCTURES, AND FIELD CONDITIONS AT THE SITE BEFORE COMMENCING WORK. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT OF ANY DISCREPANCIES.
3. TYPICAL DETAILS SHALL APPLY IN GENERAL CONSTRUCTION WHERE NO DETAILS ARE GIVEN. OMISSIONS, AND/OR FIELD CONDITIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT BEFORE PROCEEDING WITH WORK.
4. ENSURE THAT IRRIGATION SLEEVING, DRAINLINES, ELECTRICAL CONDUITS, SLEEVES, ETC. ARE IN PLACE PRIOR TO INSTALLATION OF PAVING AND WALLS.
5. CONTRACTOR SHALL MAKE NO MATERIAL SUBSTITUTIONS UNLESS APPROVED BY LANDSCAPE ARCHITECT.

MOCKUPS AND SUBMITTALS

ALL SAMPLES AND MOCKUPS TO BE REVIEWED AND APPROVED BY LANDSCAPE ARCHTIECT AND/OR OWNER'S REPRESENTATIVE PRIOR TO COMPLETING CONSTRUCTION. PREPARE PRELIMINARY MOCKUPS ON SITE TO REVIEW DURING 4 SITE VISITS MAXIMUM. ALLOW FOR CHANGES IN COLOR/FINISH SPECIFICATION FOR MATERIALS OF EQUAL COST PRIOR TO MOCKUP APPROVAL.

1. CONCRETE PAVING P-1:
   PROVIDE UP TO THREE 4'X4' MOCKUPS WITH JOINTS SHOWN.
2. PRECAST CONCRETE PAVERS:
   PROVIDE 4 FULL SIZE PAVERS FOR REVIEW ADJACENT TO CONCRETE PAVING MOCKUP
3. WOOD DECKING:
   SUBMIT CUT SHEETS FOR ALL MATERIALS INCLUDING COLOR AND FINISHES
   REVIEW 4'X4' MINIMUM MOCKUP IN PLACE
4. CONCRETE BLOCK PLANTER WALL:
   REVIEW MOCKUP IN PLACE, 4' LONG MINIMUM
5. STONE SEATWALL:
   REVIEW MOCKUP IN PLACE, 4' LONG MINIMUM

SCALE: 1" = 10'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
ROBERT F. MCCOY No. 6148
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

SHEET TITLE:

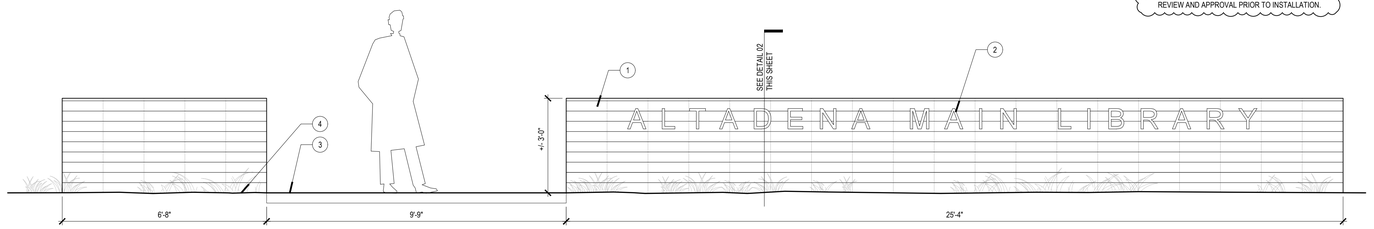
SITE CONSTRUCTION PLAN

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L102

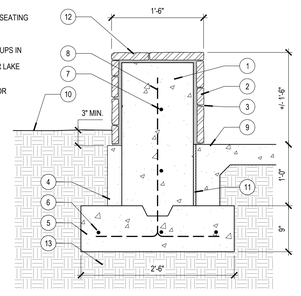
7/18/2022 11:26:03 AM



09 ENTRY SIGN WALL- ELEVATION — 1/2"=1'-0"

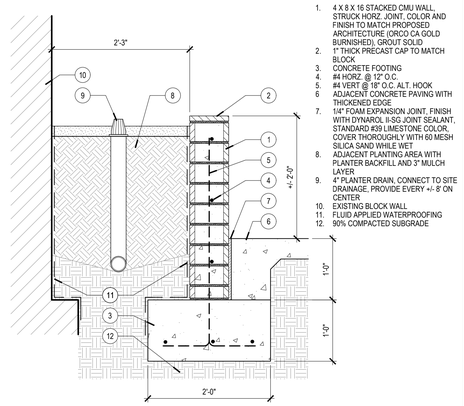
1. CONCRETE WALL
2. 1-1/2" THICK LEDGE STONE VENEER
3. SET BACK MORTAR JOINT +/- 1/2" ON SIDES TO PROVIDE DRY STACK APPEARANCE, GAPS AT 1/2" MAX. BETWEEN STONES
4. HAUNCH
5. CONCRETE FOOTING
6. (3) #4 HORZ. CONT. THROUGH FOOTING
7. (2) #4 HORZ. @ 12" O.C.
8. #4 VERT @ 18" O.C. ALT. HOOK
9. ADJACENT CONCRETE PAVING WITH THICKENED EDGE
10. ADJACENT PLANTING AREA
11. 1/4" FOAM EXPANSION JOINT
12. SET SMOOTH STONES ON TOP FOR SEATING
13. 90% COMPACTED SUBGRADE

NOTE:
A. PROVIDE UP TO TWO 4' LONG MOCKUPS IN PLACE FOR REVIEW AND APPROVAL
B. STONE TO BE TUMBLED MCGREGOR LAKE LEDGE THIN VENEER BY MONTANA ROCKWORKS, AVAILABLE THROUGH THOMPSON BUILDING MATERIALS (OR APPROVED EQUAL)



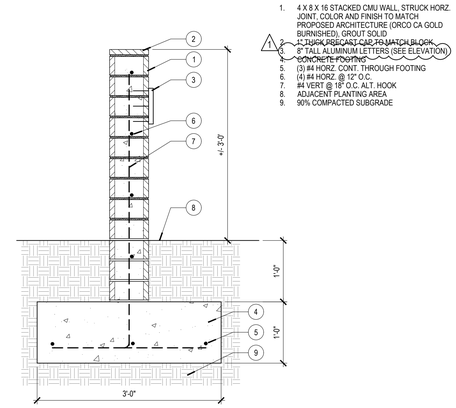
10 STONE VENEER SEAT WALL — 1"=1'-0"

1. 4 X 8 X 16 STACKED CMU WALL, STRUCK HORZ. JOINT, COLOR AND FINISH TO MATCH PROPOSED ARCHITECTURE (ORCO CA GOLD BURNISHED), GROUT SOLID
2. 1" THICK PRECAST CAP TO MATCH BLOCK
3. CONCRETE FOOTING
4. #4 HORZ. @ 12" O.C.
5. #4 VERT @ 18" O.C. ALT. HOOK
6. ADJACENT CONCRETE PAVING WITH THICKENED EDGE
7. 1/4" FOAM EXPANSION JOINT, FINISH WITH DYNAROL II-SG, JOINT SEALANT, STANDARD #39 LIMESTONE COLOR, COVER THOROUGHLY WITH 60 MESH SILICA SAND WHILE WET
8. ADJACENT PLANTING AREA WITH PLANTER BACKFILL AND 3" MULCH LAYER
9. 4" PLANTER DRAIN, CONNECT TO SITE DRAINAGE, PROVIDE EVERY +/- 8' ON CENTER
10. EXISTING BLOCK WALL
11. FLUID APPLIED WATERPROOFING
12. 90% COMPACTED SUBGRADE

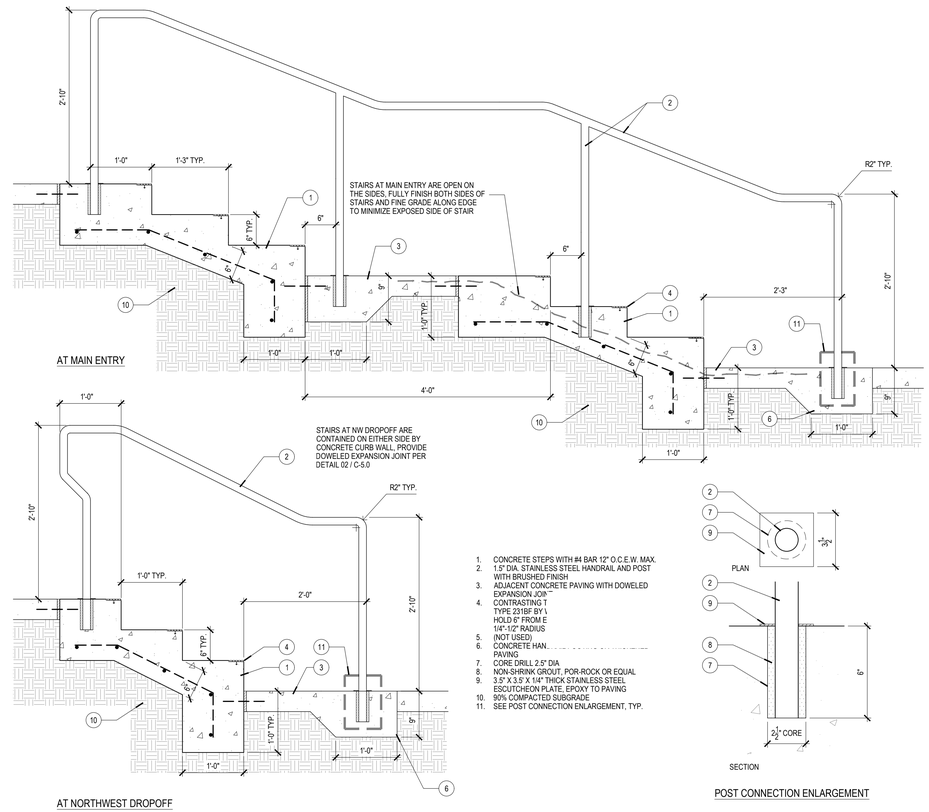


06 CONCRETE BLOCK PLANTER WALL — 1"=1'-0"

1. 4 X 8 X 16 STACKED CMU WALL, STRUCK HORZ. JOINT, COLOR AND FINISH TO MATCH PROPOSED ARCHITECTURE (ORCO CA GOLD BURNISHED), GROUT SOLID
2. ~~1" THICK PRECAST CAP TO MATCH BLOCK~~
3. 8" TALL ALUMINUM LETTERS (SEE ELEVATION)
4. CONCRETE FOOTING
5. (3) #4 HORZ. CONT. THROUGH FOOTING
6. (4) #4 HORZ. @ 12" O.C.
7. #4 VERT @ 18" O.C. ALT. HOOK
8. ADJACENT PLANTING AREA
9. 90% COMPACTED SUBGRADE



02 ENTRY SIGN WALL- SECTION — 1"=1'-0"



08 CONCRETE STEPS AND HANDRAIL — 1"=1'-0"

7/18/2022 11:25:03 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
RICHARD F. McCOY No. 6140
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

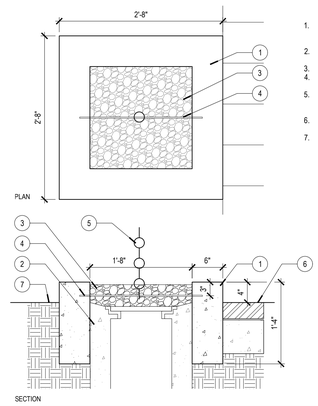
SHEET TITLE:

SITE CONSTRUCTION DETAILS

SCALE: AS SHOWN

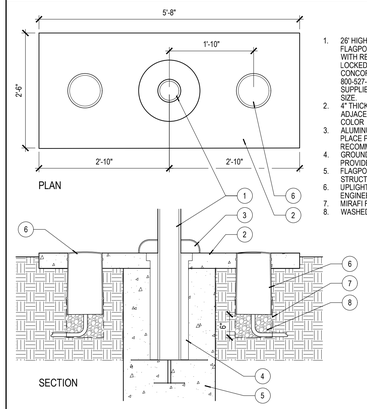
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L110



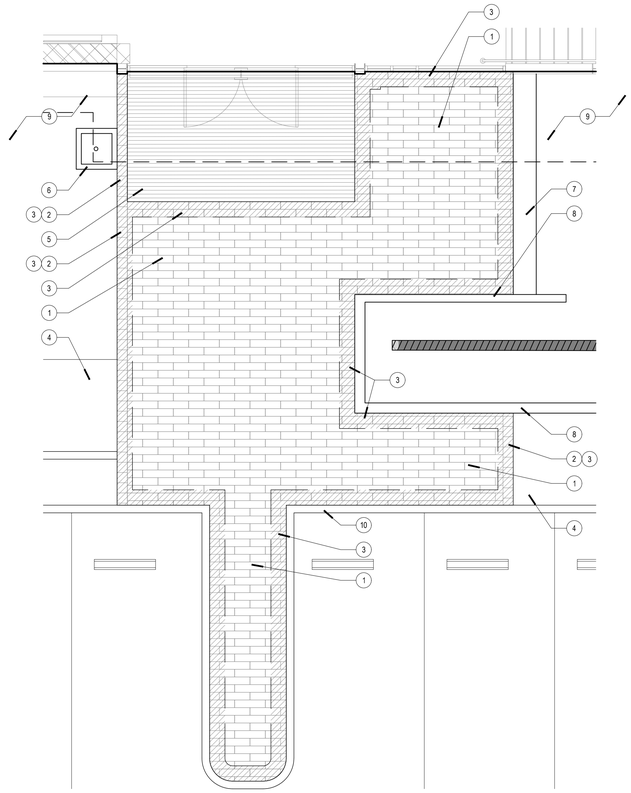
1. CONCRETE CURB, COLOR AND FINISH TO MATCH PROPOSED CONCRETE PAVING P-1
2. 12" X 12" CATCH BASIN PER CIVIL DETAIL 1, SHEET C-5.1
3. BLACK BEACH PEBBLE, 1"-3" SIZE.
4. STAINLESS STEEL DOWEL CAST IN CURB
5. RAIN CHAIN FROM ROOF OVERHEAD, SEE ARCHITECTURE DRAWINGS, CONNECT TO DOWEL
6. ADJACENT PAVER BAND OVER CONCRETE BASE
7. ADJACENT PLANTING AREA

9 DECORATIVE RAIN CHAIN DRAIN 1"=1'-0"



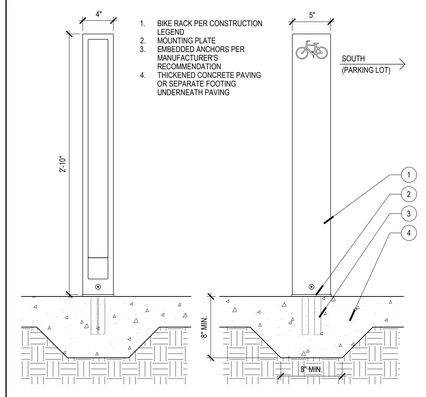
1. 26' HIGH TAPERED ALUMINUM TUBE FLAGPOLE. MODEL ESR25C61-CLR WITH REVOLVING BALL TRUCK AND LOCKED CLEAT COVER. BY CONCORD AMERICAN FLAGPOLE 800-527-3802. FLAG TO BE OWNER SUPPLIED AND NOT EXCEED 8' X 5' IN SIZE.
2. 4" THICK CONCRETE PAD, MATCH ADJACENT CONCRETE FINISH AND COLOR
3. ALUMINUM BASE CAP, EPOXY IN PLACE PER MANUFACTURERS RECOMMENDATIONS.
4. GROUND SLEEVE ASSEMBLY PROVIDED BY MANUFACTURER
5. FLAGPOLE FOOTING PER STRUCTURAL ENGINEER
6. UPLIGHT, SEE ELECTRICAL ENGINEERING DRAWINGS
7. MIRAFI FILTER FABRIC
8. WASHED GRAVEL

10 FLAGPOLE PAD ¾"=1'-0"



1. PAVER FIELD:
   6 X 24 CALIFORNIA PAVER BY ACKERSTONE
   800-258-2353
   80mm THICK
   NO CHAMFER, COLOR AND FINISH TBD
2. PAVER EDGE BAND:
   8 X 8 CALIFORNIA PAVER BY ACKERSTONE
   80mm THICK
   NO CHAMFER, COLOR AND FINISH TBD
3. CONCRETE SUBBASE AT PAVER EDGE PER SECTION
4. ADJACENT CONCRETE PAVING
5. WALK OFF GRILLE PER ARCHITECT
6. RAIN CHAIN DRAIN, SEE DETAIL 09, THIS SHEET
7. STONE VENEER SEAT WALL, SEE DETAIL 10 / L110
8. CONCRETE BLOCK PLANTER WALL, SEE DETAIL 06 / L110
9. PLANTING AREA
10. CONCRETE CURB PER CIVIL DRAWINGS

06 ENTRY PAVER ENLARGEMENT ¾"=1'-0"

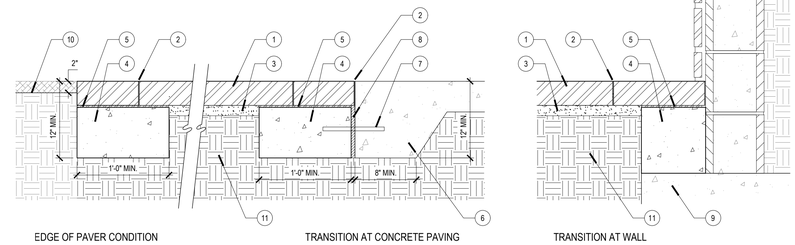


1. BIKE RACK PER CONSTRUCTION LEGEND
2. MOUNTING PLATE
3. EMBEDDED ANCHORS PER MANUFACTURER'S RECOMMENDATION
4. THICKENED CONCRETE PAVING OR SEPARATE FOOTING UNDERNEATH PAVING

11 BIKE RACK 1½"=1'-0"

1. PRECAST CONCRETE PAVERS
2. POLYMERIC SAND JOINT
3. 2" MIN. SAND LEVELING COURSE
4. CONCRETE SUBBASE AT PAVER TRANSITION
5. MORTAR SET
6. DEEPEN EDGE OF CONCRETE PAVING AT PRECAST PAVER TRANSITION
7. 8" DOWEL 18" O.C. INTO ADJACENT PAVING
8. 1/4" FOAM EXPANSION JOINT
9. PLANTER WALL FOOTING
10. FINISH GRADE WITH MULCH LAYER AT ADJACENT PLANTING AREA
11. 12" THICK LAYER OF ROAD BASE COMPACTED TO 90%, PREPARED PER GEOTECHNICAL REPORT, TYPICAL AT ALL FLATWORK

NOTES:
A. SEE DETAIL 06, THIS SHEET, FOR PAVER TYPE.
B. POLYMERIC SAND: HP NEXTGEL POLYMERIC SAND BY TECHNISEAL, COLOR GREY
C. ALL PAVERS TO RECEIVE SEALANT: SINAK HLQ-125 (OR APPROVED EQUAL) AT MANUFACTURER'S SUGGESTED RATE.

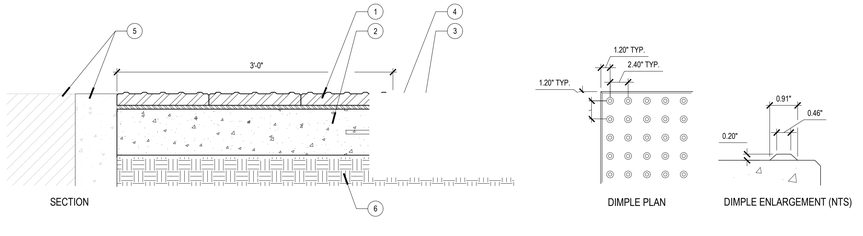


EDGE OF PAVER CONDITION | TRANSITION AT CONCRETE PAVING | TRANSITION AT WALL

07 PRECAST CONCRETE PAVERS 1½"=1'-0"

1. 12 X 12 TRUNCATED DOME PAVER BY ACKERSTONE 800-258-2353, INSTALL OVER MORTAR BASE 55mm THICK, COLOR: ONYX FM (DARK GREY)
2. 4" THICK CONCRETE SUB BASE
3. DEEPENED EDGE OF ADJACENT PEDESTRIAN CONCRETE PAVING
4. EXPANSION JOINT WITH 8" DOWELS 18" O.C.
5. ADJACENT FLUSH CURB AND ASPHALT PAVING PER CIVIL
6. SUB BASE PER CONCRETE PAVING DETAIL, SEE CIVIL

NOTES:
A. TRANSITIONS FROM RAMPS AND LANDING TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
B. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% IN ANY DIRECTION WITHIN 4' OF BOTTOM OF THE CURB RAMP.
C. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.



SECTION | DIMPLE PLAN | DIMPLE ENLARGEMENT (NTS)

08 TRUNCATED DOME PAVERS 1½"=1'-0"

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
JENNIFER L. McCOY
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

SHEET TITLE:

SITE CONSTRUCTION DETAILS

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

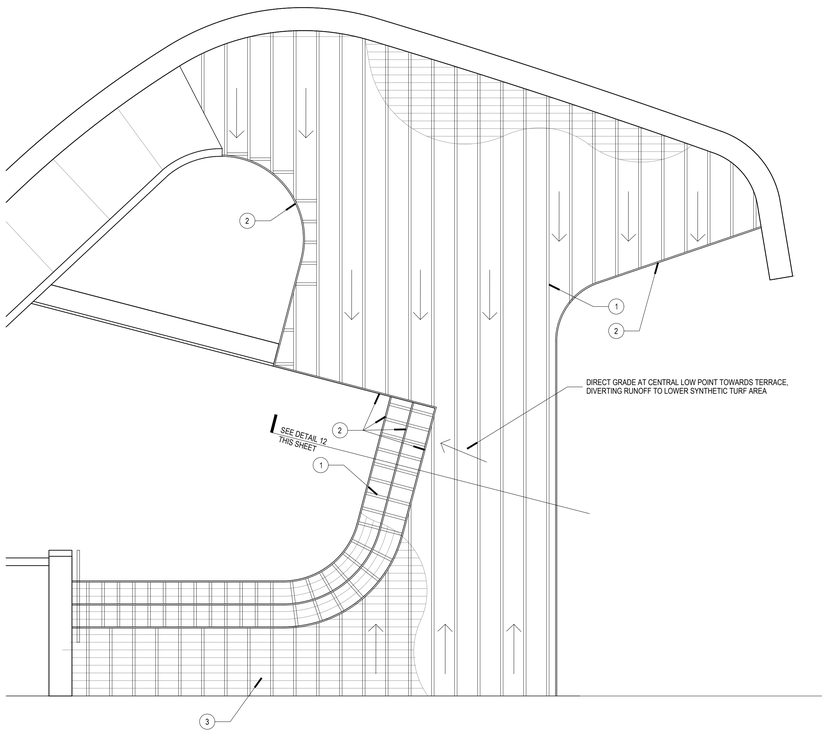
L111

7/18/2022 11:25:03 AM

1. 2 X 4 PRESSURE TREATED DOUGLAS FIR JOIST BOARD, 18" ON CENTER MIN. AT DECK, 12" ON CENTER MIN. AT TERRACE
2. 1 X FASCIA BOARD
3. 1 X 6 TREX DECKING WITH HIDDEN FASTENERS

DECKING:
TREX ENHANCE 1" GROOVED EDGE BOARD, COLOR TOASTED SAND
ATTACHMENT: UNIVERSAL FASTENER WITH STARTER CLIP
FASCIA:
TREX 1 X FASCIA
ATTACHMENT: SIMPSON STRONG TIE FASCIA BOARD SCREW
JOIST BOARDS:
2 X 4 PRESSURE TREATED DOUGLAS FIR
ATTACHMENT: SIMPSON GALVANIZED BRACKETS

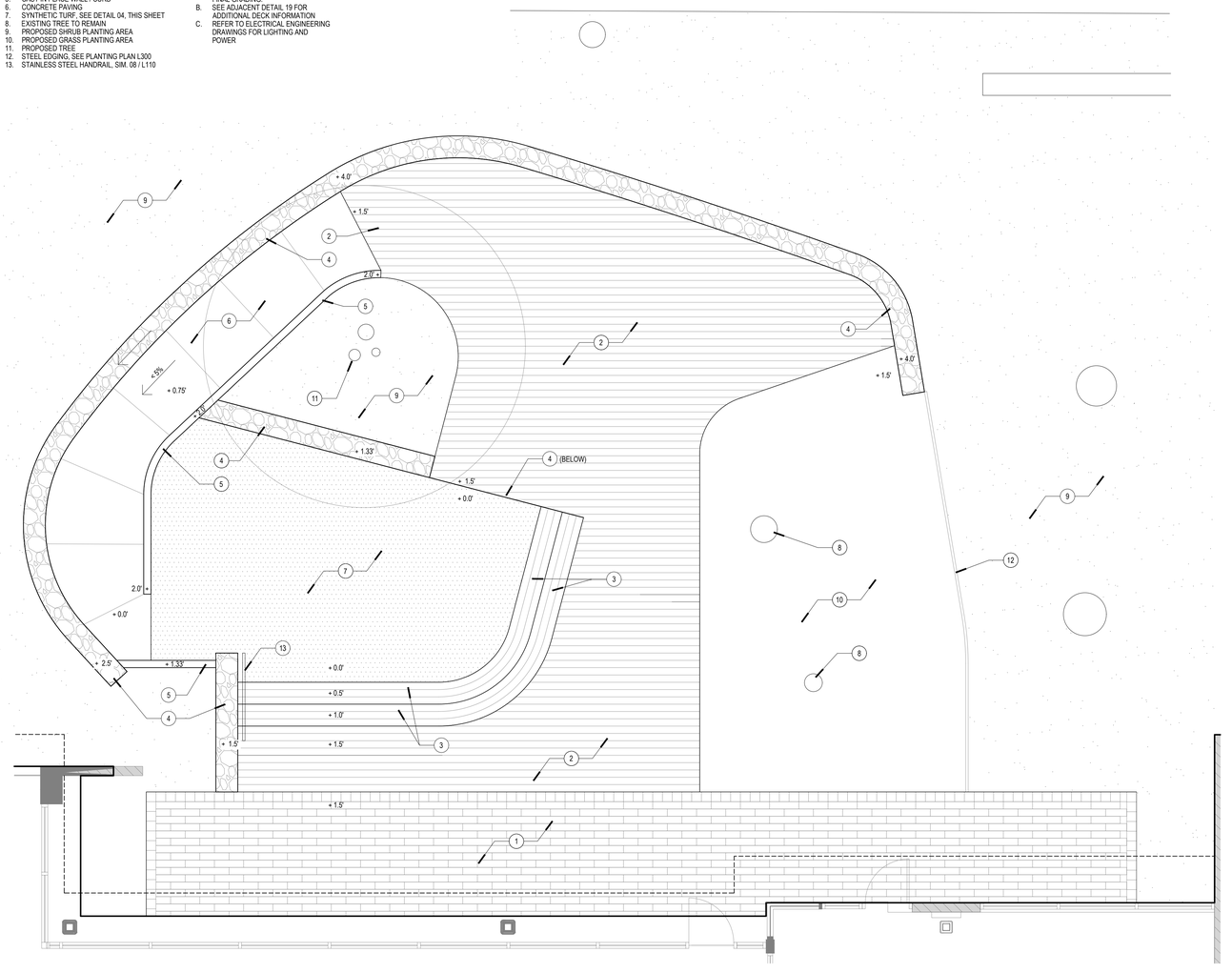
NOTES:
A. AT CURVED TERRACE PORTION PROVIDE CUSTOM OVEN TREATED TREX BOARDS TO FIT
B. CONCRETE SUB SLAB TO MAINTAIN CONTINUOUS DRAINAGE OF 1.0% TO 1.5% PARALLEL TO JOISTS AS SHOWN.



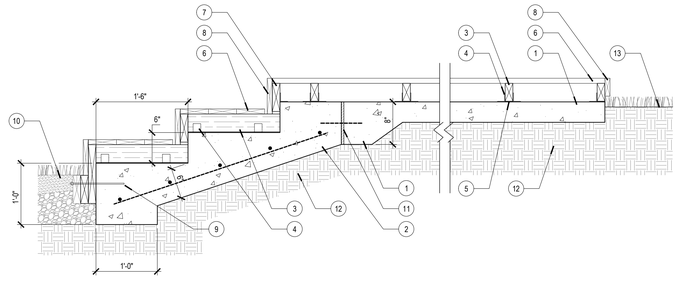
19 NORTH PATIO DECK ½"=1'-0"

1. PRECAST CONCRETE PAVERS, SEE 07 / L111
2. WOOD DECK
3. WOOD TERRACE
4. STONE VENEER SEAT WALL, SEE 10 / L110
5. CAST IN PLACE WALL / CURB
6. CONCRETE PAVING
7. SYNTHETIC TURF, SEE DETAIL 04, THIS SHEET
8. EXISTING TREE TO REMAIN
9. PROPOSED SHRUB PLANTING AREA
10. PROPOSED GRASS PLANTING AREA
11. PROPOSED TREE
12. STEEL EDGING, SEE PLANTING PLAN L300
13. STAINLESS STEEL HANDRAIL, SIM. 08 / L110

NOTES:
A. GRADING SHOWN IS TO COMMUNICATE DESIGN INTENT ONLY, REFER TO CIVIL DRAWINGS FOR FINAL GRADING
B. SEE ADJACENT DETAIL 19 FOR ADDITIONAL DECK INFORMATION
C. REFER TO ELECTRICAL ENGINEERING DRAWINGS FOR LIGHTING AND POWER



11 NORTH PATIO ENLARGEMENT ¼"=1'-0"

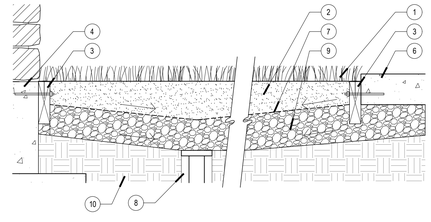


1. DECK SUBSLAB WITH PRECISE 1.0% GRADE TO DRAIN, SEE CIVIL DETAIL
2. TERRACE SUBSLAB WITH #4 BAR 18" MIN. OCEW
3. 2 X 4 PRESSURE TREATED DOUGLAS FIR JOIST BOARD, 18" ON CENTER MIN. AT DECK, 12" ON CENTER MIN. AT TERRACE
4. SIMPSON WOOD TO CONCRETE ANGLE OR APPROVED EQUAL AT 24" OC MIN.
5. 1/8" PVC SHIM
6. 1 X 6 TREX DECKING WITH HIDDEN FASTENERS
7. 2 X 6 NAILER
8. 1 X TREX FACIA BOARD
9. 10" BOLT INTO SYNTHETIC TURF HEADER
10. ADJACENT SYNTHETIC TURF
11. DOWELED EXPANSION JOINT
12. 90% COMPACTED SUBGRADE
13. ADJACENT PLANTING AREA

NOTES:
A. ALL WOOD BENEATH DECKING TO BE PRESSURE TREATED DOUGLAS FIR
B. ALL CONNECTIONS TO BE GALVANIZED OR STAINLESS STEEL

12 TYPICAL DECK SECTION AT TERRACE 1"=1'-0"

1. SYNTHETIC TURF, FASTEN TO NAILER BOARD, APPLY 3 LBS/SF FILLER PER MANUFACTURER RECOMMENDATION. PLAY SAFE SELECT 50, 300-OLIVE, BY SOUTHWEST GREENS 877-260-7888 OR APPROVED EQUAL
2. 3" MIN. UNSTABILIZED DECOMPOSED GRANITE OR SAND FILL PER MANUFACTURER RECOMMENDATIONS
3. 2 X 6 REDWOOD NAILER, DRILL AND EPOXY SS ANCHOR BOLT 3' O.C. MIN. AND 6" FROM EACH END
4. HAUNCH AT ADJACENT STONE SEATWALL
6. ADJACENT CONCRETE PAVING
7. FILTER FABRIC- MIRAFI 140N OR APPROVED EQUAL, PITCH LAYER AT 1% MIN. TO DRAINAGE
8. DRAINAGE SUMP PER CIVIL
9. 4" MIN. LAYER CRUSHED AGGREGATE BASE AT 90% RELATIVE COMPACTION
10. SUBGRADE, SCARIFY AND RECOMPACT TO AT LEAST TOP 12" TO 90% MAXIMUM DENSITY



EDGE AT STONE SEAT WALL TRANSITION AT PAVING

04 SYNTHETIC TURF 1 ½"=1'-0"

7/18/2022 11:25:03 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
SUSANNE V. McCOY No. 5161
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

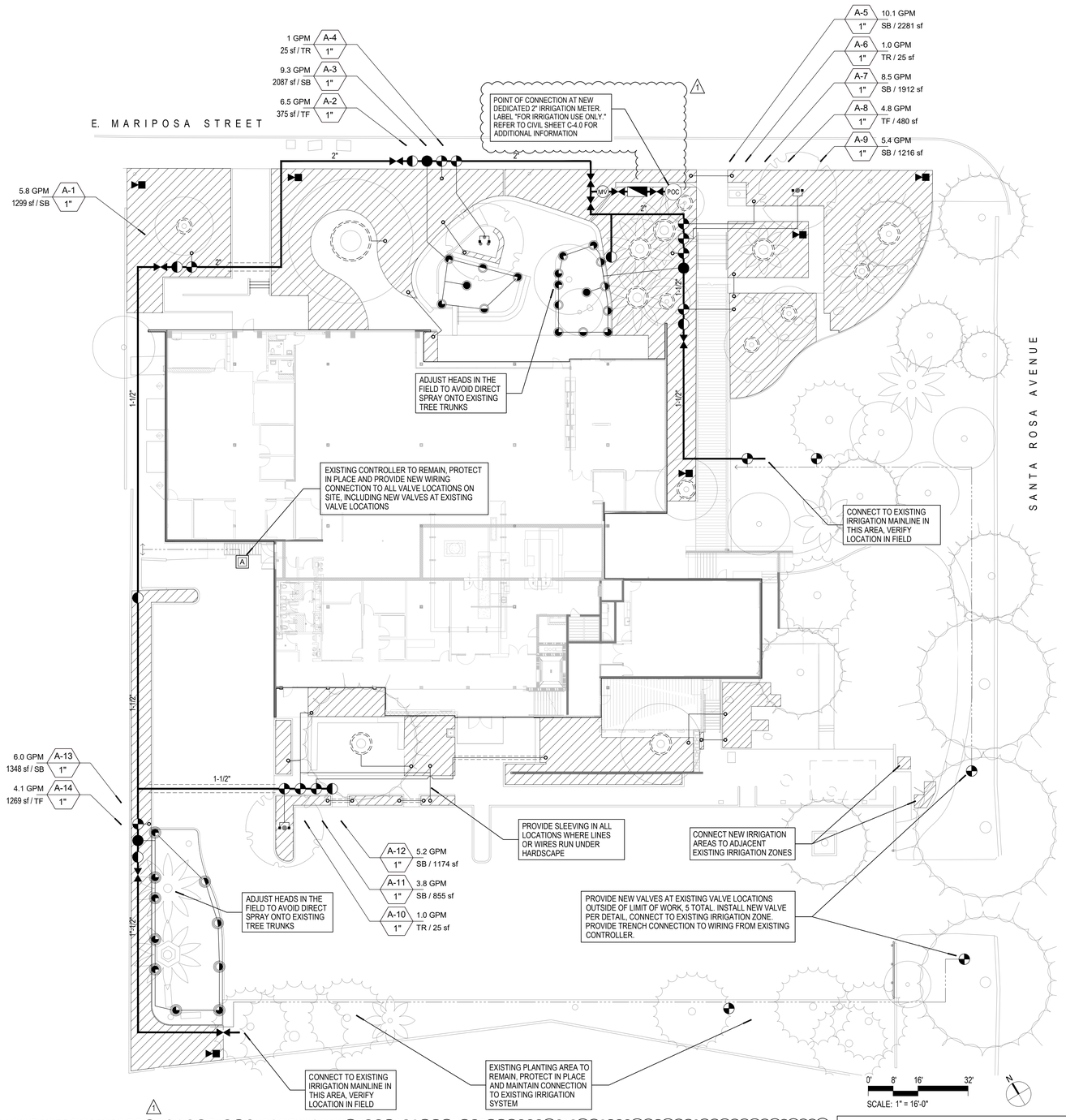
SHEET TITLE:

SITE CONSTRUCTION DETAILS

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L112



IRRIGATION LEGEND

SYMBOL	MANF.	MODEL NO.	BOX	DESCRIPTION / NOTES	PSI	FLOW RATE	DETAIL
QTR HALF FULL (RAD.) ● 6' ◔ ◒ 8' ◔ ◒ 14'	RAINBIRD	6 SERIES VAN 8 SERIES VAN R-VAN 14	ON 1806 PRS 6" POP-UP HEIGHT SPRAY BODY	HIGH EFFICIENCY ROTOR NOZZLES FOR TURF IRRIGATION AND ARTIFICIAL TURF COOLING	30	QTR THIRD HALF FULL 0.37 0.60 1.10 1.20 (GPM) 0.72 1.19 1.55 1.70 (GPM) 0.32 0.49 0.63 1.27 (GPM)	12 / L210
	NETAFIM	IRRIGATION DRIPLINE - TECHLINE CV DRIPLINE TLCV 6-18		SPACE LATERAL ROWS AT 15"-18" DRIPPER SPACING AT 18" INSTALL ON GRADE UNDER MULCH	30	0.60 GPH	10 / L210
	NETAFIM	DRIPLINE RINGS AT EXISTING TREE: TLCV-09-12 DRIPLINE WITH HEAVY DUTY CHECK VALVE, TWO LOOPS		LOCATE RING 12-18" FROM FACE OF TRUNK WITH SECOND RING AT 9" OFFSET WITHIN EARTH WATERING BASIN (PER PLANTING DETAIL), SECURE WITH PINS, COVER IN MULCH AND CONNECT TO ADJACENT DRIP IRRIGATION ZONE			14 / L210
■	RAINBIRD	RWS-M-B-1402 ROOT WATERING SYSTEM		INCLUDES FLOOD BUBBLER ON 2" POP-UP	30	0.50 GPM	13 / L210
○	NETAFIM	DRIP LINE CONNECTOR		PROVIDE 1" PVC CONNECTION TO DRIPLINE			
▶■	NETAFIM	MANUAL FLUSH VALVE- TLSOV	RAINBIRD VB10RND	INSTALL PER MANUFACTURERS SPECIFICATIONS AT END OF EACH DRIP ZONE			11 / L210
MV	BUCKNER SUPERIOR	3100 NORMALLY OPEN MASTER VALVE	RAINBIRD VBSTD	SIZE ACCORDINGLY PER LINE SIZE			04 / L210
◥■	WATTS	719-QT BACKFLOW PREVENTER	STRONG BOX SBBC-30SS	SIZE ACCORDINGLY PER LINE SIZE, PROVIDE SBBC-30SS ENCOSURE BY STRONG BOX WITH CONCRETE PAD			03 / L210
▶◀	NIBCO	T-133 BRONZE GATE VALVE	RAINBIRD VB10RND	SIZE ACCORDINGLY PER LINE SIZE			06 / L210
◔	RAINBIRD	100 - EFB-CP WITH PRF-100-RBY	RAINBIRD VBJMB	BRASS REMOTE CONTROL DRIP VALVE KIT WITH PRESSURE REGULATING BASKET FILTER			07 / L210
●	RAINBIRD	100 - EFB-CP WITH QKCHK-100	RAINBIRD VBJMB	BRASS REMOTE CONTROL VALVE KIT WITH QUICK CHECK FILTER			08 / L210
◐	RAINBIRD	44-LRC - 1" QUICK COUPLER VALVE	RAINBIRD VB10RND	QUICK COUPLER VALVE WITH LOCKING RUBBER COVER, INSTALL IN ROUND VALVE BOX PER DETAIL			09 / L210
———		MAINLINE		IRRIGATION MAINLINE- 1" TO 2" PVC SCH. 80 (SEE PLAN)			03 / L210
———		LATERAL LINE		LATERAL PIPE- 1" PVC SCH. 40			03 / L210
- - - -		SLEEVING		SCHEDULE 40 PVC SLEEVES, SIZE TO BE 2X PIPE DIAMETER OR WIRE BUNDLE SIZE.			02 / L210
—·—·—		LOW VOLTAGE CONTROL WIRE		PROVIDE CONDUIT AND DEPTH PER DETAIL, LINE NOT SHOWN ON DRAWING WHERE RUNNING ADJACENT TO NEW MAINLINE			02, 03 / L210
IRRIGATION VALVE CALLOUT Station No. / GPM / Area / Plant Type / Valve Size		PLANT MATERIAL ABBREVIATIONS: TF Turf SB Shrub / Ground Cover TR Trees PT Pots VG Vegetable Garden					

IRRIGATION NOTES

1. THE IRRIGATION DESIGN PRESENTED IN THESE DOCUMENTS IS INTENDED TO BE DIAGRAMMATIC. ALL IRRIGATION EQUIPMENT, PIPING AND VALVE LOCATIONS TO BE COORDINATED AND CONFIRMED ON FIELD.
2. THE LANDSCAPE CONTRACTOR IS REQUIRED, AS PART OF THIS SCOPE, TO PERFORM AN IRRIGATION AUDIT ON THE EXISTING IRRIGATION SYSTEM PRIOR TO WORK. SUBMIT FINDINGS TO THE GENERAL CONTRACTOR, ARCHITECT, AND LANDSCAPE ARCHITECT.
3. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL DIFFERENCES IN GRADE, LOCATION OF DRAINS, LOCATION OF WALLS, CURBS, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL IRRIGATION WORK WITH THE GENERAL CONTRACTOR, ELECTRICAL CONTRACTOR, AND ALL OTHER SUBCONTRACTORS FOR THE LOCATION AND THE INSTALLATION OF IRRIGATION.
4. THE IRRIGATION CONTRACTOR SHALL VERIFY WATER PRESSURE PRIOR TO CONSTRUCTION AND SUBMIT TO THE ARCHITECT AND OWNER'S REPRESENTATIVE.
5. WHEN IT IS APPARENT TO THE LANDSCAPE CONTRACTOR IN THE FIELD THAT OBSTRUCTIONS, GRADE DIFFERENCES, OR DIFFERENCES IN THE CALCULATED AREA DIMENSIONS EXIST THAT MAY HAVE NOT BEEN CONSIDERED IN THE DESIGN OF THE SYSTEM, THE IRRIGATION CONTRACTOR SHALL NOT WILLFULLY INSTALL THE IRRIGATION SYSTEM AS INDICATED ON THE CONSTRUCTION DRAWINGS. THE OWNER'S AUTHORIZED REPRESENTATIVE SHALL BE NOTIFIED IN WRITING OF ANY SUCH OBSTRUCTIONS OR DIFFERENCES PRIOR TO BEGINNING ANY IRRIGATION INSTALLATION. IF NOTIFICATION IS NOT RECEIVED PRIOR TO BEGINNING INSTALLATION, THE IRRIGATION CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL REVISIONS TO THE IRRIGATION SYSTEM AS DEEMED NECESSARY BY OWNER'S REPRESENTATIVE AND ALL COSTS ASSOCIATED WITH THOSE REVISIONS
6. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE PRESSURE REGULATOR ON EACH ELECTRIC CONTROL VALVE SO THE IRRIGATION HEAD OR DRIPLINE LOCATION FARTHEST AND HIGHEST IN ELEVATION FROM ITS ASSOCIATED CONTROL VALVE FUNCTIONS WITHIN THE OPERATING PRESSURE SHOWN ON THE IRRIGATION LEGEND (NOT TO EXCEED 5 PSI ABOVE THE INDICATED OPERATING PRESSURE).
7. ADHESIVES, SEALANTS AND CAULKS SHALL MEET LOCAL OR REGIONAL AIR POLLUTION CONTROL OR SOUTH COAST AQMD RULE 1168 VOC AND STATEWIDE VOC STANDARDS.
8. MATERIALS LIST SUBMITTAL: PRIOR TO INSTALLATION OF PRODUCTS, SUBMIT A DETAILED LIST OF EACH MATERIAL PROPOSED FOR USE. PREPARE TYPEWRITTEN MATERIAL LIST USING THE FOLLOWING FORMAT.

   ITEM NO. DESCRIPTION MANUFACTURER MODEL NO.
9. UPON COMPLETION OF PLANTING AND IRRIGATION, THE CONTRACTOR SHALL ARRANGE FOR A SUBSTANTIAL COMPLETION INSPECTION BY LANDSCAPE ARCHITECT. CONTRACTOR SHALL CORRECT ANY DISCREPANCIES FOUND PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF THE PROJECT.
10. LANDSCAPE CONTRACTOR TO PROVIDE 90 DAY MAINTENANCE OF PLANTING AND IRRIGATION UPON FINAL ACCEPTANCE.
11. GUARANTEE: ALL IRRIGATION EQUIPMENT SHALL BE GUARANTEED FOR REPLACEMENT AFTER FINAL INSPECTION FOR ONE YEAR.
12. CONTROLLER CHARTS: LANDSCAPE CONTRACTOR WILL PROVIDE A LAMINATED CONTROLLER CHART FOR EACH NEW CONTROLLER SHOWING ALL STATIONS IT CONTROLS. CHART MAY BE A REPRODUCTION OF THE PROJECT RECORD DRAWING, IF THE SCALE PERMITS FITTING CONTROLLER DOORS. IF PHOTO REDUCTION PRINTS ARE REQUIRED, KEEP REDUCTION TO MAXIMUM SIZE POSSIBLE TO RETAIN FULL LEGIBILITY OF ALL LINEWORK AND TEXT. IDENTIFY AREAS OF COVERAGE OF EACH REMOTE CONTROL VALVE USING DISTINCT PASTEL COLOR TONES OVER THE APPLICABLE AREA. SUBMIT CHARTS FOR REVIEW BEFORE SUBSTANTIAL COMPLETION REVIEW.
13. IF THE INSTALLED IRRIGATION SYSTEM DIFFERS FROM THE DOCUMENTED DESIGN OF THESE DRAWINGS, THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A CLEAR THOROUGH ELECTRONIC SET OF AS-BUILT DRAWINGS, INCLUDING SPECIFICATIONS OF ALL EQUIPMENT NOT MATCHING THESE DRAWINGS.
14. DEFER TO DRAWING SHEET NOTES AND CALLOUTS IN ALL INSTANCES WHERE DRAWINGS AND SPECIFICATIONS CONTRADICT.

MWELO CALCULATIONS

Reference Evapotranspiration (Eto) 52.3 MAX ETAF Non-Res 0.45

Hydrozone #	Planting Description	Water Need	Plant Factor (PF)	Irrigation Method	Irrigation Efficiency (IE)	ETAF (PF/IE)	Landscape Area (sq. ft)	ETAF x Area	Estimated Total Water Use (ETWU)
Regular Landscape Areas									
A-1	Shrubs	Low	0.3	In-Line Drip	0.85	0.35	1299	458	14,866
A-2	Synthetic Turf	Low	0.3	Spray	0.7	0.43	375	161	5,211
A-3	Shrubs	Low	0.3	In-Line Drip	0.85	0.35	2087	737	23,885
A-4	Tree	Low	0.2	Bubblers	0.8	0.25	25	6	203
A-5	Shrubs	Low	0.2	In-Line Drip	0.85	0.24	2281	537	17,403
A-6	Tree	Low	0.2	Bubblers	0.8	0.25	25	6	203
A-7	Shrubs	Low	0.3	In-Line Drip	0.85	0.35	1912	675	21,882
A-8	Turf	High	0.7	Spray	0.7	1.00	480	480	15,564
A-9	Shrubs	Low	0.3	In-Line Drip	0.85	0.35	1216	429	13,916
A-10	Tree	Low	0.2	Bubbler	0.8	0.25	25	6	203
A-11	Shrubs	Low	0.3	In-Line Drip	0.85	0.35	855	302	9,785
A-12	Shrubs	Low	0.3	In-Line Drip	0.85	0.35	1174	414	13,436
A-13	Shrubs	Medium	0.5	In-Line Drip	0.85	0.59	1348	793	25,712
A-14	Turf	High	0.7	Spray	0.7	1.00	1269	1269	41,149
					Totals		14371	6273	203,418
Special Landscape Areas									
			0.8	Spray	0.75	1	0	0	-
			0.8	Spray	0.75	1	0	0	-
			0.8	Spray	0.75	1	0	0	-
						Totals	-	-	-
								ETWU Total	203,418
								Maximum Allowable Water Allowance (MAWA)	209,697.32
								Average ETAF	0.44

IRRIGATION PRESSURE LOSS CALCULATIONS

AVAILABLE PRESSURE: 51 PSI
BASIS OF CALCULATION: FARTHEST VALVE WITH HIGHEST GPM DEMAND
VALVE: A-13
GPM DEMAND: 6.5

PRESSURE LOSS THROUGH EQUIPMENT

EQUIPMENT	QTY	SIZE	FLOW (GPM)	LOSS (PSI)*
METER	1	2"	6.5	1
BACKFLOW PREVENTER	1	2"	6.5	4.0
MASTER VALVE	1	1"	6.5	0.5
FLOW SENSOR	1	1"	6.5	0.5
GATE VALVE	5	1"	6.5	5
MAINLINE	(219 LF)	2"	6.5	0.5
	(186 LF)	1.5"	6.5	0.5
REMOTE CONTROL VALVES	7	1"	6.5	3.0
LATERAL LINE LOSSES 10%				1
MISC. FITTINGS				1
ELEVATION (13' DROP)				0
PRESSURE TO RUN DRIP EMITTERS				30
TOTAL MAX PRESSURE REQUIRED:				47

*PSI ROUNDED TO NEAREST 0.5 PSI

WATER AUDIT NOTE

THE CONTRACTOR WILL CONDUCT AN IRRIGATION AUDIT USING A CERTIFIED IRRIGATION AUDITOR, AFTER THE FINAL FIELD OBSERVATION HAS BEEN COMPLETED AND ALL IRRIGATION COMPONENTS ARE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND THE IRRIGATION SYSTEM IS ACCEPTED BY THE PROJECT LANDSCAPE ARCHITECT FOR MAINTENANCE.

THE IRRIGATION AUDIT WILL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
1. PLACE FLAGS AT EACH HEAD IN THE ZONE.
2. MEASURE SPACING AND MARK MID-POINTS BETWEEN HEADS.
3. PLACE WATER MEASURING RECEPTACLES.
4. TAKE READINGS OF WATER LEVEL IN RECEPTACLES AND RECORD RESULTS.
5. MEASURE HEAD PRESSURE IN EACH ZONE AND RECORD RESULTS.
6. AFTER COMPLETING ZONE ADVANCE TO NEXT ZONE AND REPEAT PROCEDURE.
7. SUBMIT THE RESULTS OF THE AUDIT TO THE PROJECT ARCHITECT.

THE IRRIGATION MAINTENANCE SCHEDULE TASKS LISTED TO THE RIGHT ARE INTENDED AS MINIMUM STANDARDS AND MORE FREQUENT ATTENTION MAY BE REQUIRED DEPENDING ON THE PARTICULAR SITE CONDITIONS.

AUDIT SHALL BE IN ACCORDANCE WITH THE LATEST STATE OF CALIFORNIA LANDSCAPE WATER MANAGEMENT PROGRAM AS DESCRIBED IN THE LATEST LANDSCAPE IRRIGATION AUDITOR HANDBOOK. THE LANDSCAPE IRRIGATION AUDITS TO BE CONDUCTED BY A QUALIFIED INDIVIDUAL AND THE AUDIT SCHEDULE SHALL BE CONDUCTED AT LEAST ONCE EVERY FIVE YEARS IN ACCORDANCE WITH THE REQUIREMENTS OF TITLE 20, DIVISION 1 OF THE LOS ANGELES COUNTY CODE.

MAINTENANCE TASK	FREQUENCY
1. CONTROLLER CABINET - OPEN CABINET, CLEAN OUT DEBRIS, AND REPLACE BATTERY AS NECESSARY. CHECK WIRING AND REPAIR AS NEEDED. CHECK CLOCK AND RESET, IF NECESSARY.	QUARTERLY
2. IRRIGATION SCHEDULE - ADJUST SCHEDULE FOR SEASONAL VARIATIONS AND OTHER CONDITIONS WHICH MAY AFFECT THE AMOUNT OF WATER NEEDED TO MAINTAIN PLANT HEALTH. ADJUST AS NECESSARY.	MONTHLY
3. POC - VISUALLY INSPECT COMPONENTS FOR LEAKS, PRESSURE SETTINGS, SETTLEMENT OR OTHER DAMAGE AFFECTING THE OPERATION OF A COMPONENT REPAIR AS NEEDED.	QUARTERLY
4. REMOTE CONTROL VALVES, ISOLATION VALVES AND QUICK COUPLER VALVES - VISUALLY INSPECT FOR LEAKS, SETTLEMENT, WIRE CONNECTIONS AND PRESSURE SETTINGS. REPAIR OR ADJUST AS NEEDED.	QUARTERLY
5. MAINLINE AND LATERALS - VISUALLY INSPECT FOR LEAKS OR SETTLEMENT OF TRENCH.	QUARTERLY
6. SPRINKLERS - VISUALLY CHECK FOR ANY BROKEN, MISSALIGNED OR CLOGGED HEADS, HEADS WITH INCORRECT ARC, INADEQUATE COVERAGE OR OVERSPRAY AND LOW HEAD DRAINAGE. REPAIR AS NEEDED. WEEKLY	WEEKLY
7. FILTERS AND STRAINERS - VISUALLY CHECK FOR LEAKS AND BROKEN FITTINGS. CLEAN AND FLUSH SCREENS.	MONTHLY

CONSTRUCTION OBSERVATION

THE LANDSCAPE CONTRACTOR SHALL SCHEDULE THE FOLLOWING IRRIGATION SITE OBSERVATION MEETINGS WITH AT LEAST 3 DAYS PRIOR NOTIFICATION.

1. PRE-JOB/KICK-OFF MEETING WITH LANDSCAPE CONTRACTOR, GENERAL CONTRACTOR, AND LANDSCAPE ARCHITECT.*
2. SUBSTANTIAL COMPLETION MEETING FOR PUNCH LIST PREPARATION.*
3. PUNCH LIST BACK CHECK FOR COMPLETION AND START OF 90 DAY MAINTENANCE PERIOD.*
4. TURNOVER MEETING ONE WEEK PRIOR TO COMPLETION OF 90 DAY MAINTENANCE PERIOD FOR FINAL ACCEPTANCE.*

*SIMULTANEOUS WITH PLANTING MEETING LIST

MAINTENANCE SCHEDULES

LANDSCAPE SHALL BE MAINTAINED TO ENSURE WATER EFFICIENCY. A REGULAR MAINTENANCE SCHEDULE SHALL INCLUDE, BUT NOT BE LIMITED TO, CHECKING, ADJUSTING, AND REPAIRING IRRIGATION EQUIPMENT, RESETTING THE AUTOMATIC CONTROLLER, AERATING AND DETHATCHING TURF AREAS, REPLENISHING MULCH, FERTILIZING, PRUNING, AND WEEDING IN ALL LANDSCAPE AREAS. WHENEVER POSSIBLE, REPAIR OF IRRIGATION EQUIPMENT SHALL BE DONE WITH THE ORIGINALLY SPECIFIED MATERIALS OR THEIR EQUIVALENTS.
A LANDSCAPE IRRIGATION AUDIT SCHEDULE AS REQUIRED IN CHAPTER 20.09 OF TITLE 20 MAY BE RECOMMENDED. THE MAXIMUM PERIOD BETWEEN AUDITS SHALL BE FIVE YEARS.

IRRIGATION AUDIT SCHEDULES

A SCHEDULE OF LANDSCAPE IRRIGATION AUDITS OF AT LEAST EVERY FIVE YEARS MUST BE ESTABLISHED, FOR ALL BUT SINGLE-FAMILY RESIDENCES, AND OTHER PROJECTS WITH A LANDSCAPE AREA LESS THAN 1 ACRE (0.405 HA). AS REQUIRED IN CHAPTER 20.09 OF TITLE 20 (UTILITIES CODES), AN AUDIT SATISFYING THE FOLLOWING CONDITIONS SHALL BE SUBMITTED TO THE COUNTY. AT A MINIMUM, AUDITS SHALL BE IN ACCORDANCE WITH THE LATEST STATE OF CALIFORNIA LANDSCAPE WATER MANAGEMENT PROGRAM AS DESCRIBED IN THE LANDSCAPE IRRIGATION AUDITOR HANDBOOK, PREPARED FOR THE CALIFORNIA DEPARTMENT OF WATER RESOURCES, WATER CONSERVATION OFFICE.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
BENJAMIN F. McCOY No. 6461
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 02-13-25

SHEET TITLE:

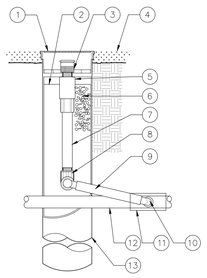
IRRIGATION PLAN

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

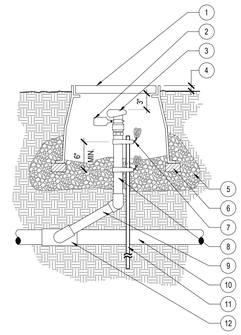
L200

7/18/2022 11:25:03 AM



1. 4-INCH GRATE
2. ROOT WATERING SYSTEM: RAIN BIRD RWS (INCLUDES BUBBLER ON RISER, GRATE)
3. BUBBLER
4. FINISH SURFACE, MULCH OR D.G.
5. CHECK VALVE
6. GRAVEL FILL
7. 1/2-INCH PVC SCH 80 NIPPLE
8. 1/2-INCH 90-DEGREE ELBOW
9. SWING PIPE, 12-INCH SWING ASSEMBLY
10. 1/2-INCH MALE NPT INLET
11. PVC SCH 40 TEE OR EL
12. LATERAL PIPE
13. 4-INCH BASKET WEAVE CANISTER WITH SAND SOCK

13	ROOT WATERING SYSTEM	NTS

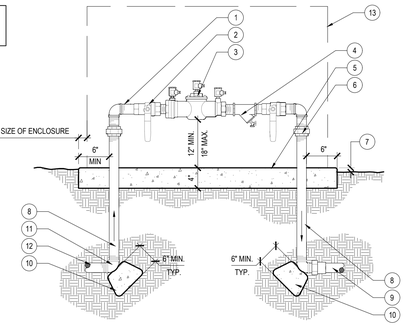


1. VALVE BOX PER IRRIGATION LEGEND
2. WATER ID TAG
3. QUICK COUPLER VALVE PER IRRIGATION LEGEND
4. FINISH GRADE:
   -1" IN TURF
   -2" IN SHRUBS
   -1/2" IN DG / DECORATIVE STONE
5. ONE (1) CU. FT. (MIN.) OF 3/4" CRUSHED ROCK AT BASE OF VALVE BOX
6. SUPPORT - COMMON RED BRICK
7. V.I.T. STAINLESS STEEL TIES - TYPICAL
8. SCH. 80 PVC NIPPLE - LENGTH AS REQUIRED
9. 1" DIA. SCH. 80 PVC SWING JOINT
10. PVC MAINLINE
11. 1/2" DIA. x 24" LENGTH GALVANIZED PIPE STAKE
12. SCH. 80 PVC TEE FITTING

NOTES:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE
B. 12" MIN. CLEAR SPACE SHALL BE MAINTAINED BETWEEN THE QUICK COUPLER VALVE BOX AND ANY ADJACENT HARDSCAPE - WHERE OCCURS

09	QUICK COUPLER VALVE	3/4"=1'-0"

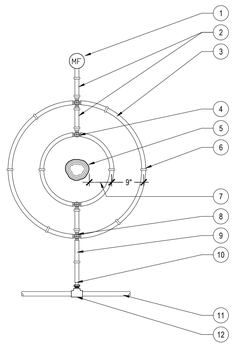
SPECIFIED ENCLOSURE TO REMAIN 6" MIN. BELOW HEIGHT OF ADJACENT ENTRY SIGN WALL



1. BRASS NIPPLE, 4" LENGTH, MIN. (TYP.)
2. BALL VALVE, TYPICAL FOR (2) TWO
3. REDUCED PRESSURE TYPE BACKFLOW PREVENTER
4. BRASS WYE STRAINER WITH 40 MESH MONEL SCREEN AND HOSE BIB.
5. NATURAL GRAY CONCRETE BASE WITH HAND TROWELED FINISH AND 1/4" TOOLED RADIUS EDGES
6. BRASS UNION (2)
7. FINISH GRADE:
   7.1. -1/2" BELOW F.S. IN TURF
   7.2. - 1 1/2" BELOW F.S. IN SHRUB/GC
8. BRASS RISER
9. PIPE OUT TO IRRIGATION SYSTEM - ADAPT AS REQUIRED
10. CAST IN PLACE CONCRETE THRUST BLOCK, 8" X 8" X 6" DEEP MIN.
11. BRASS 90 DEGREE ELL, TYPICAL FOR (4)
12. PIPE IN FROM POINT OF CONNECTION - ADAPT AS REQUIRED
13. PROVIDE AND INSTALL SECURE ENCLOSURE. SEE IRRIGATION LEGEND FOR TYPE. INSTALL PER MANF. SPEC.

NOTE:
A. INSTALL BACKFLOW PREVENTER AS REQUIRED BY LOCAL CODES AND HEALTH DEPARTMENT - VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION

05	REDUCED PRESSURE BACKFLOW PREVENTOR	3/4"=1'-0"

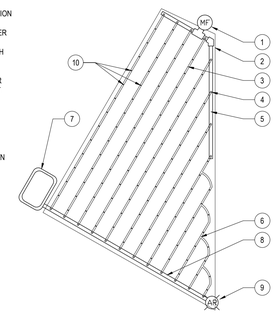


1. MANUAL FLUSHING VALVE PER PLAN
2. BLANK DRIP TUBING EXHAUST HEADER
3. DRIP TUBING PER LEGEND
4. DRIP TUBING TEE
5. TREE TRUNK
6. 6-INCH SOIL STAPLE
7. DISTANCE FROM FIRST TUBING LOOP TO FACE OF TRUNK:
   24" BOX = 9"
   36"-48" BOX = 12"
   60" BOX AND LARGER = 18"
   EXISTING TREE = 18"
8. DRIP TUBING CROSS FITTING
9. BLANK DRIP TUBING SUPPLY HEADER
10. DRIP TUBING START CONNECTION MALE ADAPTER
11. PVC LATERAL
12. PVC FEMALE THREADED TEE

14	DRIPLINE TREE RING	NTS

1. MANUAL FLUSH VALVE PLUMBED TO PVC OR POLY
2. AREA PERIMETER
3. DRIP TUBING. SEE LEGEND FOR EMITTER AND LATERAL LINE SPACING
4. DRIP TUBING START CONNECTION MALE ADAPTER
5. PVC OR POLY EXHAUST HEADER
6. DRIP TUBING TEE
7. REMOTE CONTROL VALVE WITH DISC FILTER AND PRESSURE REGULATING VALVE
8. PVC OR POLY SUPPLY HEADER
9. AIR RELIEF VALVE AT HIGHEST ELEVATION OF DRIP ZONE
10. OFFSET EMITTER LOCATIONS EVERY OTHER ROW

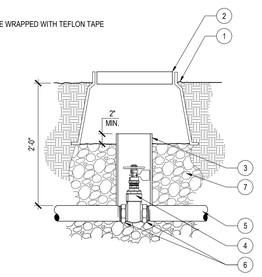
NOTES:
A. DRIP TUBING TO RUN PERPENDICULAR TO DIRECTION OF SLOPE



10	DRIPLINE LAYOUT - IRREGULAR AREAS	NTS

1. FINISH GRADE
   - 1" IN TURF
   - 2" IN SHRUBS
   - 1/2" IN DG
2. VALVE BOX PER IRRIGATION LEGEND
3. 6" Ø PVC PIPE EXTENSION - LENGTH AS REQUIRED
4. GATE VALVE PER IRRIGATION LEGEND
5. PVC MAINLINE PER IRRIGATION LEGEND
6. PVC MALE ADAPTER - TWO (2) REQUIRED
7. 3/4" GRAVEL - TWO (2) CUBIC FEET AT BASE OF VALVE

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE

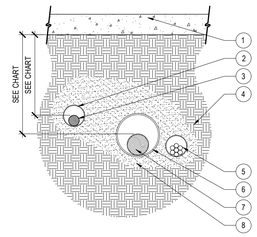


06	GATE VALVE	1"=1'-0"

1. VEHICULAR or PEDESTRIAN PAVING - REFER TO CONSTRUCTION LAYOUT PLANS FOR SPECIFIC CONDITION
2. LATERAL LINE SLEEVING SHALL BE SCH. 40 PVC - SLEEVE DIA. SHALL BE 2 x LATERAL DIA.
3. LATERAL LINE - REFER TO SPECIFICATIONS
4. BACKFILL - 90% RELATIVE COMPACTION, MINIMUM - REFER TO GEOTECHNICAL REPORT
5. CONTROL WIRE BUNDLE SLEEVING SHALL BE SCH. 40 PVC PIPE
6. MAINLINE SLEEVING SHALL BE SCH. 40 PVC PIPE - SLEEVE DIA. SHALL BE 2 x MAINLINE DIA.
7. MAINLINE - REFER TO SPECIFICATIONS
8. SAND BACKFILL - 6" BASE & 6" OF COVER, MIN.

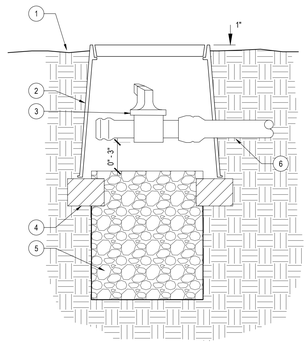
NOTES:
A. ALL IRRIGATION WIRES, LATERALS AND MAINLINE UNDER HARDSCAPE SHALL BE PLACED IN SLEEVES
B. IRRIGATION CONTRACTOR SHALL COORDINATE ALL SLEEVING LOCATIONS & SIZES WITH HARDSCAPE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION
C. ALL SLEEVES SHALL EXTEND A MINIMUM OF 12" BEYOND THE EDGE OF THE HARDSCAPE SURFACE

LINE TYPE	LOCATION	DEPTH
PRESSURIZED MAINLINE	IN LANDSCAPE	24"
	UNDER VEH. PAVING	36"
LATERAL LINES	IN LANDSCAPE	18"
	UNDER VEH. PAVING	30"



02	IRRIGATION SLEEVING	1"=1'-0"

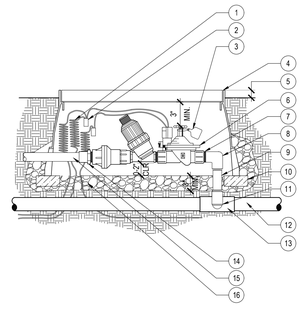
1. FINISH GRADE
2. 10" ROUND VALVE BOX
3. LINE FLUSHING VALVE TLSOV BY NETAFIM
4. BRICK SUPPORTS (3)
5. 3/4" GRAVEL SUMP (1 CUBIC FT.)
6. 17mm PVC LATERAL (OR EXHAUST HEADER)



11	MANUAL FLUSH VALVE	NTS

1. 30" LENGTH OF COILED WIRE
2. WATER PROOF CONNECTOR
3. ID TAG
4. VALVE BOX PER IRRIGATION LEGEND
5. FINISH GRADE:
   -1" IN TURF
   -2" IN SHRUBS
   -1/2" IN DG / DECORATIVE STONE
6. REMOTE CONTROL VALVE PER IRRIGATION LEGEND
7. SCH. 80 PVC NIPPLE (CLOSE)
8. SCH. 40 PVC ELL
9. SCH. 80 PVC NIPPLE (LENGTH AS REQUIRED)
10. BRICK (1 OF 4)
11. SCH. 80 PVC NIPPLE (2" LENGTH, HIDDEN) AND SCH. 40 PVC ELL
12. PVC MAINLINE PIPE
13. SCH. 40 PVC TEE OR ELL
14. SCH. 40 PVC MALE ADAPTER
15. PVC LATERAL PIPE
16. (3) CUBIC FEET, MIN. OF 3/4" WASHED GRAVEL. BASE OF VALVE SHALL BE 0-2" CLEAR OF GRAVEL SURFACE.

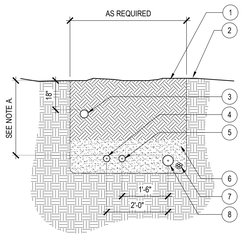
NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE



07	REMOTE CONTROL DRIP VALVE	1 1/2"=1'-0"

1. BACKFILL- 90% RELATIVE COMPACTION
2. FINISH GRADE
3. NON-PRESSURIZED LATERAL LINE PIPING
4. COMMUNICATION CABLE CONDUIT (WHERE REQUIRED)
5. FLOW SENSOR CABLE AND CONDUIT
6. APPROVED TOP SOIL OR SAND BACKFILL - PROVIDE 3" UNDER PIPE AND 6" ABOVE PIPE
7. CONTROL WIRES BUNDLED AND TAPED AT 10'-0" INTERVALS - INSTALL ADJACENT TO MAINLINE
8. PRESSURIZED MAINLINE PIPING

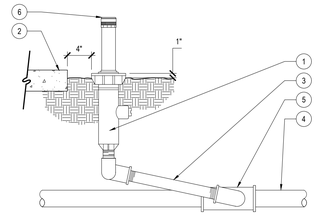
NOTES:
A. MININUM BACKFILL DEPTHS FROM FINISH GRADE TO TOP OF MAINLINE SHALL BE AS FOLLOWS:
   - 24" IN PLANTING AREAS
   - 36" UNDER PAVED AREAS
B. ALL PLASTIC PIPING SHALL BE SNAKED IN TRENCHES
C. TIE A LOOSE 20" LOOP IN WIRING AT ANY CHANGE IN DIRECTION GREATER THAN 30° - UNTIE ANY LOOPS AFTER ALL CONNECTIONS HAVE BEEN MADE



03	TRENCHING DETAIL	1/2"=1'-0"

1. SPRAY BODY PER LEGEND
2. PAVING EDGE, HEADER OR WALL
3. SWING JOINT 12" MIN.
4. PVC LATERAL LINE
5. PVC ELBOW or TEE
6. BUBBLER OR ROTATOR SPRAY HEAD PER LEGEND

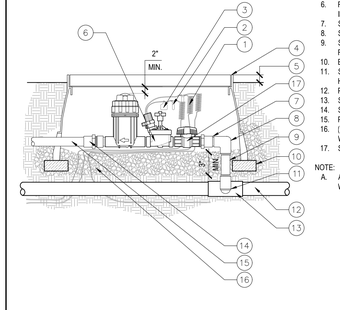
NOTES:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE



12	POP UP HEAD	1 1/2"=1'-0"

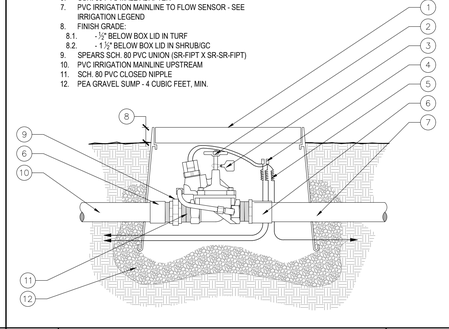
1. 30" LENGTH OF COILED WIRE
2. WATER PROOF CONNECTOR
3. ID TAG
4. VALVE BOX PER LEGEND
5. FINISH GRADE:
   -1" IN TURF
   -2" IN SHRUBS
   -1/2" IN DG / DECORATIVE STONE
6. REMOTE CONTROL ASSEMBLY PER IRRIGATION LEGEND
7. SCH. 80 PVC NIPPLE (CLOSE)
8. SCH. 80 PVC ELL
9. SCH. 80 PVC NIPPLE (LENGTH AS REQUIRED).
10. BRICK (1 OF 4)
11. SCH. 80 PVC NIPPLE (2" LENGTH, HIDDEN) AND SCH. 40 PVC ELL
12. PVC MAINLINE PIPE
13. SCH. 80 PVC TEE OR ELL
14. SCH. 40 PVC MALE ADAPTER
15. PVC LATERAL PIPE
16. (3) CUBIC FEET, MIN. OF 3/4" MINUS, WASHED GRAVEL
17. SCH. 80 PVC BALL VALVE

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE



08	REMOTE CONTROL VALVE ASSEMBLY	1 1/2"=1'-0"

1. PLASTIC VALVE BOX
2. MASTER VALVE PER PLAN
3. CHRISTY'S TAG #ID-MAX-P2-RC1P2
4. SPEARS DS-500 DRI-SPLICE WIRE CONNECTORS
5. CONTROL AND MASTER VALVE WIRES WITH EXPANSION LOOP
6. SCH. 80 PVC MALE ADAPTER
7. PVC IRRIGATION MAINLINE TO FLOW SENSOR - SEE IRRIGATION LEGEND
8. FINISH GRADE:
   8.1. -1/2" BELOW BOX LID IN TURF
   8.2. - 1 1/2" BELOW BOX LID IN SHRUB/GC
9. SPEARS SCH. 80 PVC UNION (SR-FIPT X SR-SR-FIPT)
10. PVC IRRIGATION MAINLINE UPSTREAM
11. SCH. 80 PVC CLOSED NIPPLE
12. PEA GRAVEL SUMP - 4 CUBIC FEET, MIN.



04	MASTER VALVE	3"=1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
JUDITH T. McCOY
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

SHEET TITLE:

IRRIGATION DETAILS

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L210

7/18/2022 11:25:03 AM

IRRIGATION SCHEDULING- ESTABLISHMENT PERIOD

IRRIGATION CONTROLLER SCHEDULE

DATE:	2/12/2025	WUCOLS ZONE:	South Inland	LA Sq. Ft. : 14,371	REVISION HISTORY:
PROJECT:	Altadena Main Library				
PROJECT CITY:	Altadena, CA	CIMIS ETo REF. CITY:	Altadena, CA	SLA Sq. Ft. : 0	REVISED BY:
CLIENT:	Altadena Library District				
PREPARED BY:	Ben McCoy, Dept. of Space	Annual Eto:	52.3		

ESTABLISHMENT

NOTE: THIS SCHEDULE IS INTENDED AS A STARTING POINT ONLY. THE CONTRACTOR SHALL ADJUST RUN TIMES FOR ACTUAL SITE CONDITIONS DURING OBSERVATION OF PLANT MATERIAL. CONTRACTOR SHALL ADJUST SCHEDULE TO RUN MULTIPLE START TIMES IF RUNOFF OCCURS. WATER BETWEEN 6PM AND 6AM ONLY.

NOTES: 1. ESTIMATED WATER USE DOES NOT EXCEED CALCULATED MAWA VALUE FOR THE PROJECT.

E.T. DATA

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MONTHLY	2.1	2.9	3.9	4.5	5.7	6.5	7.3	7.1	5.9	4.2	2.6	2.0
WEEKLY	0.475	0.725	0.882	1.051	1.290	1.519	1.652	1.606	1.379	0.950	0.607	0.452

SCHEDULING DATA

PERCENT OF ET	100%	DAYS PER WEEK	3

STATION

STATION	IRRIGATION SCHEDULE - MINUTES PER DAY											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3	5	6	7	9	11	12	11	10	7	4	3
2	9	14	18	21	26	30	33	32	27	19	12	9
3	8	12	14	17	21	25	27	26	23	16	10	7
4	5	7	9	11	13	15	17	16	14	10	6	5
5	4	7	8	10	12	14	16	15	13	9	6	4
6	6	8	10	12	15	18	19	19	16	11	7	5
7	10	15	18	21	26	31	33	32	28	19	12	9
8	10	15	18	21	26	30	33	32	28	19	12	9
9	10	15	18	21	26	31	33	32	28	19	12	9
10	6	8	10	12	15	18	19	19	16	11	7	5
11	10	15	18	21	26	31	33	32	28	19	12	9
12	8	12	14	17	21	25	27	26	23	16	10	7
13	13	20	24	29	35	42	45	44	38	26	17	12
14	10	15	18	21	26	30	33	32	28	19	12	9
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	109	167	203	242	297	350	380	370	318	219	140	104
WINDOW	1.8	2.8	3.4	4.0	5.0	5.8	6.3	6.2	5.3	3.6	2.3	1.7

MINUTES
HOURS

STATION

STATION	IRRIGATION SCHEDULE - STATION INFORMATION					
	PLANT TYPE	IRRIG. TYPE	EFFICIENCY	PRECIP. RATE	HYDROZONE	PLANT COEF.
1	Shrubs	In-Line Drip	0.85	1.00	Low	0.3
2	Synthetic Turf	Spray	0.7	0.43	Low	0.3
3	Shrubs	In-Line Drip	0.85	0.43	Low	0.3
4	Tree	Bubblers	0.8	0.50	Low	0.2
5	Shrubs	In-Line Drip	0.85	0.50	Low	0.2
6	Tree	Bubblers	0.8	0.43	Low	0.2
7	Shrubs	In-Line Drip	0.85	0.35	Low	0.3
8	Turf	Spray	0.7	1.00	High	0.7
9	Shrubs	In-Line Drip	0.85	0.35	Low	0.3
10	Tree	Bubbler	0.8	0.43	Low	0.2
11	Shrubs	In-Line Drip	0.85	0.35	Low	0.3
12	Shrubs	In-Line Drip	0.85	0.43	Low	0.3
13	Shrubs	In-Line Drip	0.85	0.43	Moderate	0.5
14	Turf	Spray	0.7	1.00	High	0.7
15	1	1	1	1.00	1	0
16	1	1	1	1.00	1	0
17	1	1	1	1.00	1	0
18	1	1	1	1.00	1	0
19	1	1	1	1.00	1	0
20	1	1	1	1.00	1	0
21	1	1	1	1.00	1	0
22	1	1	1	1.00	1	0
23	1	1	1	1.00	1	0
24	1	1	1	1.00	1	0

IRRIGATION SCHEDULING- ESTABLISHED

IRRIGATION CONTROLLER SCHEDULE

DATE:	2/12/2025	WUCOLS ZONE:	South Inland	LA Sq. Ft. : 14,371	REVISION HISTORY:
PROJECT:	Altadena Main Library				
PROJECT CITY:	Altadena, CA	CIMIS ETo REF. CITY:	Altadena, CA	SLA Sq. Ft. : 0	REVISED BY:
CLIENT:	Altadena Library District				
PREPARED BY:	Ben McCoy, Dept. of Space	Annual Eto:	52.3		

ESTABLISHED

NOTE: THIS SCHEDULE IS INTENDED AS A STARTING POINT ONLY. THE CONTRACTOR SHALL ADJUST RUN TIMES FOR ACTUAL SITE CONDITIONS DURING OBSERVATION OF PLANT MATERIAL. CONTRACTOR SHALL ADJUST SCHEDULE TO RUN MULTIPLE START TIMES IF RUNOFF OCCURS. WATER BETWEEN 6PM AND 6AM ONLY.

NOTES: 1. ESTIMATED WATER USE DOES NOT EXCEED CALCULATED MAWA VALUE FOR THE PROJECT.

E.T. DATA

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MONTHLY	2.1	2.9	3.9	4.5	5.7	6.5	7.3	7.1	5.9	4.2	2.6	2.0
WEEKLY	0.475	0.725	0.882	1.051	1.290	1.519	1.652	1.606	1.379	0.950	0.607	0.452

SCHEDULING DATA

PERCENT OF ET	75%	DAYS PER WEEK	3

STATION

STATION	IRRIGATION SCHEDULE - MINUTES PER DAY											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3	4	5	6	7	8	9	9	7	5	3	2
2	7	11	13	16	19	23	25	24	21	14	9	7
3	6	9	11	13	16	19	20	20	17	12	7	6
4	4	5	7	8	10	11	12	12	10	7	5	3
5	3	5	6	7	9	11	12	11	10	7	4	3
6	4	6	8	9	11	13	14	14	12	8	5	4
7	7	11	13	16	20	23	25	24	21	14	9	7
8	7	11	13	16	19	23	25	24	21	14	9	7
9	7	11	13	16	20	23	25	24	21	14	9	7
10	4	6	8	9	11	13	14	14	12	8	5	4
11	7	11	13	16	20	23	25	24	21	14	9	7
12	6	9	11	13	16	19	20	20	17	12	7	6
13	10	15	18	22	26	31	34	33	28	19	12	9
14	7	11	13	16	19	23	25	24	21	14	9	7
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	82	125	152	182	223	262	285	278	238	164	105	78
WINDOW	1.4	2.1	2.5	3.0	3.7	4.4	4.8	4.6	4.0	2.7	1.7	1.3

MINUTES
HOURS

STATION

STATION	IRRIGATION SCHEDULE - STATION INFORMATION					
	PLANT TYPE	IRRIG. TYPE	EFFICIENCY	PRECIP. RATE	HYDROZONE	PLANT COEF.
1	Shrubs	In-Line Drip	0.85	1.00	Low	0.3
2	Synthetic Turf	Spray	0.7	0.43	Low	0.3
3	Shrubs	In-Line Drip	0.85	0.43	Low	0.3
4	Tree	Bubblers	0.8	0.50	Low	0.2
5	Shrubs	In-Line Drip	0.85	0.50	Low	0.2
6	Tree	Bubblers	0.8	0.43	Low	0.2
7	Shrubs	In-Line Drip	0.85	0.35	Low	0.3
8	Turf	Spray	0.7	1.00	High	0.7
9	Shrubs	In-Line Drip	0.85	0.35	Low	0.3
10	Tree	Bubbler	0.8	0.43	Low	0.2
11	Shrubs	In-Line Drip	0.85	0.35	Low	0.3
12	Shrubs	In-Line Drip	0.85	0.43	Low	0.3
13	Shrubs	In-Line Drip	0.85	0.43	Moderate	0.5
14	Turf	Spray	0.7	1.00	High	0.7
15	1	1	1	1.00	1	0
16	1	1	1	1.00	1	0
17	1	1	1	1.00	1	0
18	1	1	1	1.00	1	0
19	1	1	1	1.00	1	0
20	1	1	1	1.00	1	0
21	1	1	1	1.00	1	0
22	1	1	1	1.00	1	0
23	1	1	1	1.00	1	0
24	1	1	1	1.00	1	0

7/18/2022 11:25:03 AM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
BENJAMIN T. McCOY No. 6467
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	02/13/2025	RESUBMITTAL #1

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	02-13-25

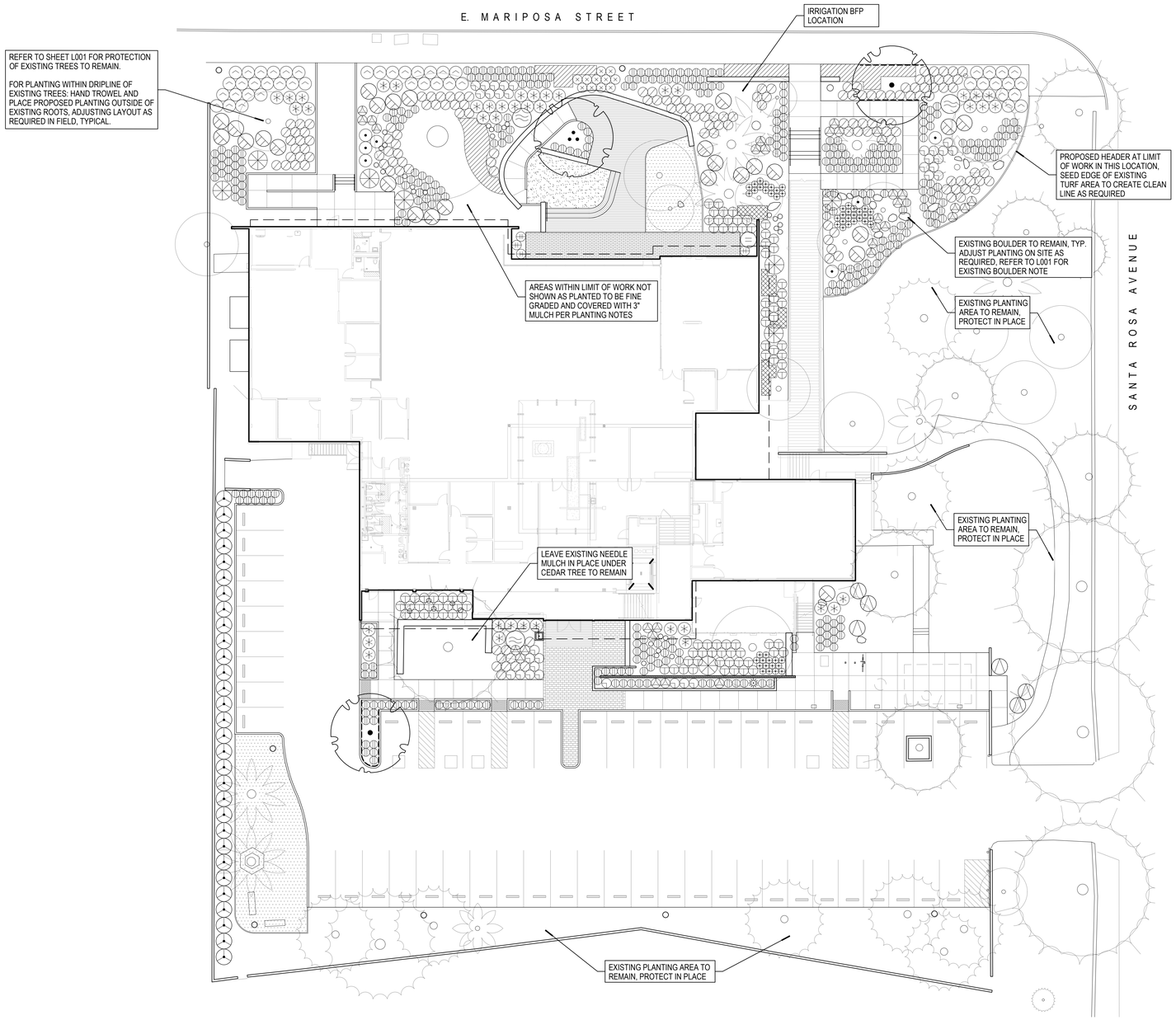
1 SHEET TITLE:

IRRIGATION SCHEDULING

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

L211



TREE LEGEND

SYMBOL	BOTANIC NAME COMMON NAME	SIZE / FORM	WATER REQ.	QTY	DETAIL
	QUERCUS ILEX HOLLY OAK	48" BOX STD. FORM 5' CLR TRUNK	LOW	2	01, 05 L310
	QUERCUS AGRIFOLIA COAST LIVE OAK	72" BOX SLENDER MULTI	LOW	1	
	EXISTING TREE TO REMAIN, PROTECT IN PLACE, REFER TO SHEET L001				

SHRUB AND GROUNDCOVER LEGEND

SYMBOL	BOTANIC NAME COMMON NAME	SIZE / SPACING	WATER REQ.	QTY.	DETAIL
	ACHILLEA MILLEFOLIUM COMMON YARROW	4" POT △ @12" O.C.	LOW	152	02 L310
	ARCTOSTAPHYLOS 'HOWARD MCMINN' HOWARD MCMINN MANZANITA	15 GAL @ 6' O.C.	VERY LOW	3	
	BACCHARIS PILULARIS 'TWIN PEAKS' DWARF COYOTE BRUSH	5 GAL @4' O.C.	LOW	46	
	BERBERIS AQUIFOLIUM VAR. REPENS CREEPING BARBERRY	1 GAL @2' O.C.	LOW	89	
	CAREX TUMULICOLA BERKELEY SEDGE	1 GAL @2.5' O.C.	LOW	365	
	EPILOBIUM CANUM CALIFORNIA FUCHSIA	1 GAL @3' O.C.	LOW	11	
	FESTUCA CALIFORNICA CALIFORNIA FESCUE	1 GAL @3' O.C.	LOW	144	
	FRANGULA CAL. 'MOUND SAN BRUNO' MOUND SAN BRUNO COFFEEBERRY	15 GAL @5' O.C.	LOW	26	
	HETEROMELES ARBUTIFOLIA TOYON	15 GAL @6' O.C.	LOW	8	
	LUPINUS LATIFOLIUS BROADLEAF LUPINE	1 GAL @18" O.C.	LOW	32	
	SALVIA APIANA WHITE SAGE	1 GAL @4' O.C.	LOW	7	
	SALVIA CLEVELANDII 'WINIFRED GILMAN' WINIFRED GILMAN SAGE	5 GAL @4' O.C.	LOW	42	
	SALVIA SPATHACEA HUMMINGBIRD SAGE	1 GAL @2' O.C.	LOW	50	
	SISYRINCHIUM BELLUM BLUE-EYED GRASS	4" POT △ @18" O.C.	LOW	240	
	SPHAERALCEA AMBIGUA DESERT MALLOW	1 GAL @3' O.C.	LOW	33	
	TRICHOSTEMA LANATUM WOOLLY BLUE CURLS	1 GAL @3' O.C.	LOW	32	
	YUCCA ALOIFOLIA SPANISH BAYONET	24" BOX @3' O.C.	LOW	1	
	AUCUBA JAPONICA JAPANESE LAUREL	5 GAL @3' O.C.	MED	4	
	CAMELLIA JAPONICA JAPANESE CAMELLIA	15 GAL @5' O.C.	MED	1	
	JUNIPERUS × PFITZERIANA 'SEA GREEN' SEA GREEN JUNIPER	15 GAL @5' O.C.	MED	6	
	LIGUSTRUM JAPONICUM JAPANESE PRIVET	5 GAL @5' O.C.	MED	30	

TURF LEGEND

		WATER REQ.	QTY.	DETAIL
	MARATHON II TURF SODDED	HIGH	1745 SF	
	SYNTHETIC TURF	LOW	375 SF	04 L111

LANDSCAPE MATERIAL LEGEND

SYMBOL	ITEM	QTY.
	3/16" x 4" STEEL EDGING W/ 16" STEEL ANCHORING STAKES 6' O.C. MAX. BLACK POWDERCOAT COLOR. AVAILABLE THROUGH JD RUSSEL COMPANY 800-888-7425. INSTALL PER MANUFACTURER'S RECOMMENDATION.	218 LF
	12" DEEP ROOT BARRIER, SEE DETAIL 04 / L310	80 LF

PLANTING NOTES

1. VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO START OF WORK.
2. UPON COMPLETION OF SITE HARDSCAPE DEMOLITION AND ROUGH GRADING CONTRACTOR SHALL TAKE A MINIMUM OF 3 SOIL SAMPLES EQUALLY SPACED ON SITE AND SUBMIT TO:
   WALLACE LABORATORIES
   365 CORAL CIRCLE EL SEGUNDO, CA 90245
   310-615-0116
   www.wlabs.com
   AMENDED TOPSOIL, BACKFILL MIX, AND SOIL IMPROVEMENT RECOMMENDATIONS PER SOILS REPORT. PROVIDE SUBMITTAL FOR APPROVAL BY LANDSCAPE ARCHITECT.
3. SOIL PREPARATION: PRIOR TO PLANTING OF ANY MATERIALS, COMPACTED SOILS SHALL BE TRANSFORMED TO A FRIABLE CONDITION.
4. AFTER LANDSCAPE DEMO, CONTRACTOR SHALL HAND REMOVE ANY WEEDS PRESENT. HERBICIDE SHALL NOT BE USED ON THIS PROJECT.
5. ALL CLEARANCE DATA PER LOCAL JURISDICTION'S TREE PLANTING STANDARDS AND GUIDELINES.
6. LANDSCAPE CONTRACTOR TO PROVIDE THE FOLLOWING SUBMITTALS FOR REVIEW AND APPROVAL:
   A. PHOTOGRAPHS OF PLANT MATERIAL 15 GALLON AND SMALLER (SHRUBS) WITH NURSERY LOCATION
   B. PHOTOGRAPHS OF TREES WITH NURSERY LOCATION FOR TAGGING
   C. CUTSHEETS OF ALL PROPOSED DRY GOOD MATERIALS INCLUDING BUT NOT LIMITED TO TREE STAKES, TREE TIES, PLANT TABLETS, EDGING, WOOD MULCH, SOIL AMENDMENTS, DECORATIVE STONE, AND WEED FABRIC.
7. NO SUBSTITUTIONS FOR PLANT MATERIAL SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL BY THE LANDSCAPE ARCHITECT. IN THE EVENT A PLANT CANNOT BE LOCATED, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LIST OF NURSERIES CONTACTED, AS WELL AS AVAILABLE POTENTIAL SUBSTITUTIONS.
8. LANDSCAPE ARCHITECT SHALL HAVE THE OPPORTUNITY TO INSPECT AND APPROVE ALL SPECIMEN AND BOX MATERIALS AT JOB SITE PRIOR TO PLANTING. ALL UNACCEPTABLE MATERIAL SHALL BE REMOVED FROM JOB SITE AND REPLACED WITH ACCEPTABLE MATERIAL AT CONTRACTOR'S EXPENSE.
9. LANDSCAPE ARCHITECT SHALL APPROVE FINAL PLACEMENT OF TREES PRIOR TO PLANTING. CONTRACTOR SHALL GIVE AT LEAST THREE (3) BUSINESS DAYS NOTICE FOR PLANT LAYOUT APPROVAL.
10. LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL THEFT OR DAMAGE TO PLANT MATERIAL ONCE PLANT MATERIAL IS DELIVERED TO THE JOB SITE, PROVIDE PROPER MEASURES TO SECURE AND PROTECT MATERIAL.
11. PRIOR TO PLACING ANY BARK MULCH OR AGGREGATE MULCH, OR SOD, A COMPLETE IRRIGATION COVERAGE TEST IS TO BE PERFORMED, INCLUDING BUT NOT LIMITED TO OVERHEAD SPRAY AND DRIP SYSTEMS.
12. A MINIMUM 3 INCH LAYER OF MULCH SHALL BE APPLIED ON ALL EXPOSED PLANTING AREAS (NEW AND EXISTING) WHERE DECORATIVE STONE IS NOT SPECIFIED. "FOREST FLOOR" BY AGUINA GREEN OR APPROVED EQUAL. CONTRACTOR SHALL SUBMIT SAMPLE TO LANDSCAPE ARCHITECT FOR APPROVAL.
13. ALL AREAS SHALL BE GRADED TO SLOPE TO CATCH BASINS OR FLOW LINES AS INDICATED ON THE CIVIL PLANS. SOIL SHALL BE 1½" BELOW ADJACENT HEADERS AND PAVING.
14. UPON COMPLETION OF ALL PLANTING OPERATIONS, THE PORTION OF THE PROJECT USED FOR THE APPARATUS OF THIS WORK SHALL BE CLEANED OF ALL DEBRIS, SUPERFLUOUS MATERIAL AND EQUIPMENT. ALL SUCH MATERIALS AND EQUIPMENT SHALL BE ENTIRELY REMOVED FROM THE PROJECT SITE. PAVING SHALL BE WASHED CLEAN AT THE COMPLETION OF WORK.
15. UPON COMPLETION OF PLANTING, THE CONTRACTOR SHALL ARRANGE FOR A SUBSTANTIAL COMPLETION INSPECTION BY LANDSCAPE ARCHITECT. CONTRACTOR SHALL CORRECT ANY DISCREPANCIES FOUND PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF THE PROJECT.
16. CONTRACTOR SHALL INCLUDE AND PERFORM A **90 DAY MAINTENANCE PERIOD** UPON COMPLETION OF THE ENTIRE SCOPE OF WORK. MAINTENANCE PERIOD IS FOR THE ENTIRE SITE. NO INDIVIDUAL PORTIONS WILL BE RELEASED UNDER A SEPARATE MAINTENANCE UNLESS PRIOR WRITTEN APPROVAL IS PROVIDED.
17. GUARANTEE: ALL PLANT MATERIAL SHALL BE GUARANTEED FOR REPLACEMENT AFTER FINAL INSPECTION AS FOLLOWS:
    5 GAL. AND SMALLER-90 DAYS
    15 GAL. AND LARGER-ONE YEAR
18. UPON FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL SUBMIT TO THE OWNER SIGNED ORIGINALS OF ALL MATERIALS AND LABOR RELEASES.
19. PLANT QUANTITIES IN LEGEND ARE FOR REFERENCE ONLY, CONTRACTOR TO PROVIDE AND INSTALL ALL PLANT MATERIAL SHOWN ON PLANS.
20. DEFER TO DRAWING SHEET NOTES AND CALLOUTS IN ALL INSTANCES WHERE DRAWINGS AND SPECIFICATIONS CONTRADICT.

CONSTRUCTION OBSERVATION

THE LANDSCAPE CONTRACTOR SHALL SCHEDULE THE FOLLOWING PLANTING SITE OBSERVATION MEETINGS WITH AT LEAST 3 DAYS PRIOR NOTIFICATION. THE FOLLOWING ITEMS SHALL BE REVIEWED:

1. PRE-JOB/KICK-OFF MEETING WITH LANDSCAPE CONTRACTOR, GENERAL CONTRACTOR, AND LANDSCAPE ARCHITECT.*
2. TREE MATERIAL AND LAYOUT: REVIEW OF ALL TREES ON SITE PRIOR TO PLANTING, WITH TREE PITS DUG AND INSPECTION TUBES PREPARED.
3. SUBSTANTIAL COMPLETION MEETING FOR PUNCH LIST PREPARATION.*
4. PUNCH LIST BACK CHECK FOR COMPLETION AND START OF 90 DAY MAINTENANCE PERIOD.*
5. TURNOVER MEETING ONE WEEK PRIOR TO COMPLETION OF 90 DAY MAINTENANCE PERIOD FOR FINAL ACCEPTANCE.*

*SIMULTANEOUS WITH IRRIGATION MEETING LIST

0' 8' 16' 32'
SCALE: 1" = 16'-0"

N

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO
690 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711

STAMP

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-24

SHEET TITLE:

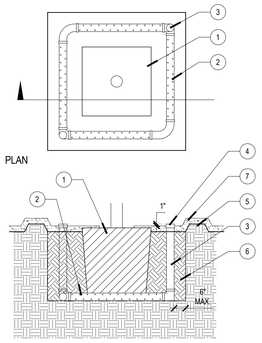
PLANTING PLAN

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

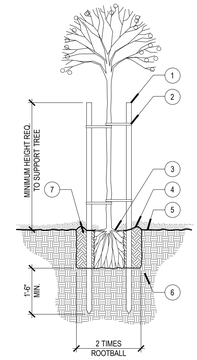
L300

7/18/2022 11:25:03 AM



1. TREE ROOTBALL
2. 4" DIA. PREFORATED PVC PIPE SDR-35, WRAP IN FILTER FABRIC SOCK (MIRAFI 140N)
3. 4" DIA. SOLID PVC INSPECTION PIPE (2 PER TREE)
4. 4" ROUND GRATE CAP, BLACK, NDS OR APPROVED EQUAL
5. EARTH WATERING BASIN PER TREE PLANTING DETAIL
6. AMENDED BACKFILL PER SOILS REPORT
7. MULCH LAYER

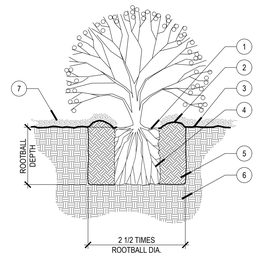
05	TREE INSPECTION PIPE	3/8"=1'-0"



1. WOOD STAKES: LODGEPOLE PINE, 2-INCH, 12-FOOT LENGTH, WITH A TEN-INCH TAPERED DRIVING POINT AND CHAMFERED TOP. UNTREATED, NATURAL WOOD COLOR. PLACE STAKES AT RIGHT ANGLE TO PREVAILING WIND OR AS DIRECTED BY LANDSCAPE ARCHITECT.
2. CINCH TIES: 32-INCH BLACK CINCH TYPE; TWO DOUBLE CINCH TIES PER TREE; V.I.T. COMPANY, INC. 714-891-8338
3. ROOTBALL CROWN 1" ABOVE FINISH GRADE
4. EARTH WATERING BASIN- 4" MIN. HEIGHT, 12" CLEAR FROM OUTSIDE EDGE OF ROOTBALL; LOCATE IRRIGATION WITHIN BASIN
5. FINISH GRADE
6. UNDISTURBED SOIL. SCARIFY SIDES AND BOTTOM OF PIT
7. PREPARED BACKFILL MIX PER SOIL REPORT RECOMMENDATIONS

NOTES:
A. PLANT PIT SHOWN IS FOR 15 GALLON SIZE - FOR LARGER MATERIAL, PLANT PIT SHALL BE 12" (MIN.) LARGER THAN BOX SIZE ON ALL SIDES AND NO DEEPER THAN BOX DEPTH
B. V.I.T. CINCH TIES ARE TO BE ATTACHED PER MANF RECOMMENDATIONS
C. FOOT TAMP BACKFILL IN 6"-10" LIFTS

01	TREE PLANTING	1/2"=1'-0"

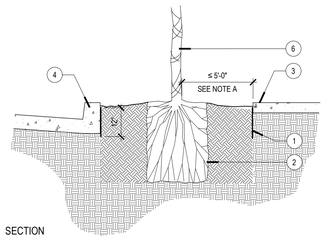


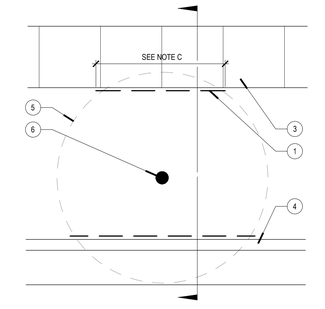
1. CROWN OF SHRUB TO BE PLANTED 1" ABOVE FINISH GRADE. KEEP MULCH 3" CLEAR OF PLANT STEM (EXCEPT FOR GRASSES)
2. EARTH WATERING BASIN- 4" MIN. HEIGHT, 12" CLEAR FROM OUTSIDE EDGE OF ROOTBALL, LOCATE IRRIGATION WITHIN BASIN
3. FINISH GRADE
4. ROOTBALL
5. PREPARED BACKFILL MIX PER SOIL REPORT RECOMMENDATIONS
6. UNDISTURBED SOIL. SCARIFY SIDES AND BOTTOM OF PIT
7. 3" MULCH LAYER

02	SHRUB PLANTING	NTS

1. 12" DEEP X 24" WIDE ROOT CONTROL BARRIER BY DEEP ROOT 415-781-9700. TOP OF BARRIER SHALL BE 1"-2" BELOW FINISH GRADE AND SHALL NOT BE VISIBLE.
2. TREE ROOTBALL
3. ADJACENT HARDSCAPE
4. CONCRETE CURB AND GUTTER WHERE APPLICABLE
5. MATURE DRIP LINE OF TREE AS SHOWN PER PLAN
6. TREE TRUNK.

NOTES:
A. USE ROOT BARRIERS EVERYWHERE THE CENTER OF TREE TRUNKS ARE PLANTED WITHIN 5' OF ANY HARDSCAPE ELEMENT (CURB, PAVING, WALL, UTILITY, ETC.) OR WITHIN 1.5 X THE NOMINAL BOX SIZE.
B. POSITION ROOT BARRIER AS CLOSE TO HARDSCAPE ELEMENT AS POSSIBLE. DO NOT WRAP TREE ROOT BALL - ROOT BARRIER RIBS SHALL BE FACING TOWARDS THE TREE
C. LENGTH OF ROOT BARRIER SHALL BE EQUAL TO THE MATURE DRIPLINE OF THE PARTICULAR TREE TO BE PLANTED AS DEFINED BY PLANTING PLAN SYMBOL SIZE, NOT BY THE INSTALLED SIZE.
D. APPLY MASTIC SEALER TO JOINT BETWEEN CONCRETE SURFACE AND ROOT BARRIER FOR ADDED ROOT PROTECTION AND TO AVOID SOIL AND DEBRIS FROM BEING TRAPPED BETWEEN BARRIER AND CONCRETE.
E. ROOT BARRIER TO BE CONTINUOUS WHERE MULTIPLE TREES ARE ALIGNED AND MEET CRITERIA OF NOTE A.
F. INSTALL PER MANUFACTURERS RECOMMENDATIONS.





04	ROOT BARRIER	1/2"=1'-0"

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

DEPARTMENT OF SPACE

SITE DESIGN STUDIO
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711

STAMP

NO.	DATE	REVISIONS
1	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-24

SHEET TITLE:

PLANTING DETAILS

SCALE: AS SHOWN

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

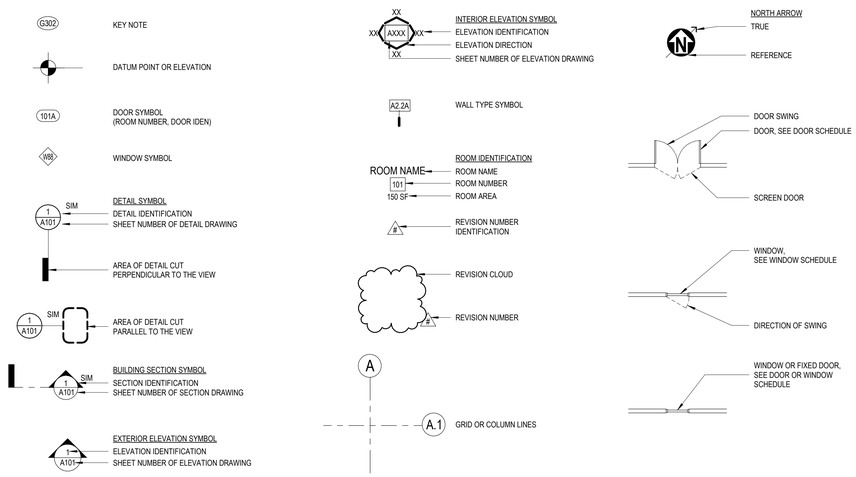
L310

7/18/2022 11:25:03 AM

ARCHITECTURAL ABBREVIATIONS

AB	ANCHOR BOLT
ABV	ABOVE
AC	ASPHALT CONCRETE
ACOUS	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
AD	AREA DRAIN
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AFS	ABOVE FINISH SLAB
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
AP	ACESS PANEL
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
AV	AUDIO VISUAL
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BLW	BELOW
BM	BENCHMARK
BS	BOTH SIDES
BSMT	BASEMENT
BTM	BOTTOM
BTWN	BETWEEN
BW	BOTH WAYS
CAB	CABINET
CAHR	CLEAR ALL HEART REDWOOD
CB	CATCH BASIN
CBU	CEMENTITIOUS BACKER UNIT
CCTV	CLOSE CIRCUIT TELEVISION
CEM PLAS	CEMENT PLASTER
CER	CERAMIC
CG	CORNER GUARD
CH	CHANNEL
CI	CAST IRON
CIP	CAST IN PLACE
CJ	CONSTRUCTION JOINT
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
COL	COLUMN
COM	COMMON
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CORR	CORRIDOR
CT	CERAMIC TILE
CTRSK	COUNTERSINK
CW	COLD WATER
d	PENNY
DBL	DOUBLE
DEM	DEMOLISH
DF	DRINIKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
(E)	EXISTING
E	EAST
EA	EACH
EB	EXPANSION JOINT
EF	EXHAUST FAN
EL	ELEVATION
ELECT	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EV	ELECTRIC VEHICLE
EVCS	ELECTRIC VEHICLE CHARGING STATION
EXH	EXHAUST
EXP	EXPANSION
EXST	EXISTING
EXT	EXTERIOR
FA	FIRE ALARM
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FACE
FG	FINISH GRADE
FHC	FIRE HOSE CABINET
FHMS	FLAT HEAD MACHINE SCREW
FHWS	FLAT HEAD WOOD SCREW
FIN	FINISH
FIN FL	FINISH FLOOR
FLR	FLOOR
FLRG	FLOORING
FLUOR	FLUORESCENT
FND	FOUNDATION
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOS	FACE OF STUD
FT	FOOT, FEET
FTG	FOOTING
FURN	FURNITURE
FURR	FURRING
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GFRC	GLASS FIBER REINFORCED CONCRETE
GFRG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS
GLU LAM	GLUE LAMINATED
GR	GRADE
GS	GALVANIZED STEEL
GSM	GALVANIZED SHEET METAL
GYP BD	GYPSUM BOARD
HB	HOSE BIBB
HC	HOLLOW CORE
HDR	HEADER
HDW	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HVAC	HEATING,VENTILATION, AIR CONDITIONING
HW	HOT WATER
HWD	HARDWOOD
ID	INSIDE DIAMETER
INCL	INCLUDE
INFO	INFORMATION
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
JAN	JANITOR
JH	JOIST HANGER
JT	JOINT
KD	KILN FRIED
KIT	KITCHEN
LAB	LABORATORY
LAM	LAMINATE, LAMINATION
LAV	LAVATORY
LB	POUND
LF	LINEAR FOOT
LH	LEFT HAND
LTG	LIGHTING
LVR	LOUVER
LW	LIGHT WEIGHT
MACH	MACHINE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MDO	MEDIUM DENSITY OVERLAY
ME	METAL EDGE
MECH	MECHANICAL
MEMB	MEMBRANE
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
ML	METAL LATH
MRGB	MOSITURE RESISTANT GYPSUM BOARD
MS	MACHINE SCREW
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MUL	MULLION
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NRCA	NATIONAL ROOFING CONTRACTORS ASSOCIATION
NTS	NOT TO SCALE
OBSC	OBSCURE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OVERFLOW DRAIN
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OFS	OUTSIDE FACE OF STUD
OH	OPPOSITE HAND
OPP	OPPOSITE
PA	PUBLIC ADDRESS
PCF	POUNDS PER CUBIC FOOT
PDF	POWDER DRIVEN FASTENER
PERF	PERFORATED
PERP	PERPENDICULAR
PL	PLATE OR PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLF	POUNDS PER LINEAR FOOT
PLWD	PLYWOOD
PR	PAIR
PREFAB	PREFABRICATED
PRKG	PARKING
PROJ	PROJECT
PROP	PROPERTY
PSF	POUNDS PER SQAURE FOOT
PSI	POUNDS PER SQAURE INCH
PT	PRESSURE TREATED
PTDF	PRESSURE TREATED DOUGLAS FIR
PTN	PARTITION
PVC	POLYVINYL CHLORIDE
PWR	POWDER
QT	QUARRY TILE
QTR	QUARTER
QUAN	QUANTITY
R	RISER
RA	RETURN AIR
RAD	RADIUS
RCP	ROOF DRAIN
RD	REFLECTED CEILING PLAN
RE	RIM ELEVATION
REF	REFERENCE
REFR	REFRIGERATOR
REINF	REINFORCE (D) (ING) (MENT)
REM	REMOVE
REQD	REQUIRED
RET	REVISION
REV	RETURN
RH	RIGHT HAND
RHMS	ROUND HEAD MACHINE SCREW
RHWS	ROUND HEAD WOOD SCREW
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RSR	RISER
RWD	REDWOOD
RWL	RAIN WATER LEADER
S	SOUTH
S/S	SERVICE SINK
SA	SUPPLY AIR
SC	SOLID CORE
SCD	SEE CIVIL DRAWINGS
SCHED	SCHEDULE
SCVWD	SANTA CLARA VALLEY WATER DISTRICT
SECT	SECTION
SED	SEE ELECTRICAL DRAWINGS
SHT	SHEET
SHTG	SHEETING
SHTHG	SHEATHING
SIM	SIMILAR
SK	SINK
SLD	SEE LANDSCAPE DRAWINGS
SM	SHEET METAL
SMD	SEE MECHANICAL DRAWINGS
SMS	SHEET METAL SCREW
SPD	SEE PLUMBING DRAWINGS
SPEC	SPECIFICATION
SPKR	SPEAKER
SQ	SQAURE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SS	SANITARY SEWER
SSD	SEE STRUCTURAL DRAWINGS
SST	STAINLESS STEEL
ST	STREET
STAG	STAGGERED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
T	TREAD
T&G	TONGUE & GROOVE
TBD	TO BE DETERMINED
TEL	TELEPHONE
TEMP	TEMPORARY
THRU	THROUGH
TK BD	TACK BOARD
TMPD GL	TEMPERED GLASS
TOC	TOP OF CURB
TOJ	TOP OF JOIST
TOP	TOP OF PARAPET
TOS	TOP OF SLAB
TV	TELEVISION
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTABLE POWER SUPPLY
UTIL	UTILITY
VB	VINYL BASE
VCP	VITRIFIED CLAY PIPE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VG	VERTICAL GRAIN
VIF	VERIFY IN FIELD
VOL	VOLUME
VTR	VENT TO ROOF
VTW	VENT TO WALL
VWC	VINYL WALL COVERING
W	WEST
W/	WITH
W/O	WITHOUT
W/W	WALL TO WALL
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WF	WIDE FLANGE
WH	WATER HEATER
WI	WOODWORK INSTITUTE
WP	WATERPROOF
WS	WOOD SCREW
WSCT	WAINSCOT
WT	WEIGHT
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
	ANGLE
@	AT
C	CENTER LINE
°	DEGREES
Ø	DIAMETER
=	EQUAL
>	GREATER THAN
<	LESS THAN
±	PLUS OR MINUS (TOLERANCE)
#	POUNDS
P	PROPERTY LINE
'	FOOT OR FEET
"	INCH OR INCHES

ARCHITECTURAL LEGEND



DETAIL NUMBERING SYSTEM

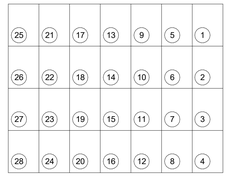
DETAILS ARE NUMBERED ACCORDING TO THEIR LOCATION ON EACH SHEET, AND ARE NOT NUMBERED CONSECUTIVELY.

DETAIL PLANS, ELEVATIONS, SECTIONS AND DETAILS ARE NUMBERED ACCORDING TO THE MODULE SYSTEM SHOWN IN THE ILLUSTRATION AT LEFT.

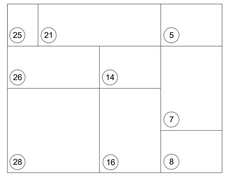
EACH DETAIL MAY OCCUPY ONE OR MORE WHOLE MODULES - OR REGULAR FRACTIONS OF A WHOLE MODULE (IE, 1-1/3 MODULES WIDE BY 2-1/2 MODULES HIGH). THE DETAIL MODULE IS USED TO ESTABLISH THE IDENTIFYING LABEL FOR EACH DETAIL, NOT TO LIMIT THE SIZE OF THE DETAIL.

THE NUMBER OF THE MODULE (IE, OR)
WHICH OCCURS IN THE LOWER LEFT CORNER OF THE MODULE -- OR SEVERAL MODULES GROUPED TOGETHER TO COMPRISE A SINGLE DETAIL -- DETERMINES THE NUMBER OF THE DETAIL PLAN, ELEVATIONS, SECTION, OR DETAIL (AS SHOWN IN THE ILLUSTRATION AT LEFT). ALTHOUGH THE MODULE NUMBERS OCCUR IN CONSECUTIVE ORDER, NOT ALL NUMBERS ARE NECESSARILY USED ON EACH SHEET.

DETAIL MODULE LAYOUT



DETAIL NUMBERING EXAMPLE

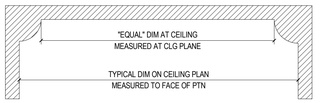


ARCHITECTURAL GENERAL NOTES

1. THE FOLLOWING GENERAL NOTES APPLY TO ALL ARCHITECTURAL DRAWINGS. FOR NOTES APPLICABLE TO ALL DRAWINGS OF ALL DISCIPLINES, REFER TO THE "PROJECT GENERAL NOTES" - SEE SHEET G001.
2. THIS SHEET LISTS STANDARDS, SYMBOLS, AND ABBREVIATIONS. ITEMS SHOWN ON THIS SHEET DO NOT NECESSARILY APPEAR WITHIN THE PROJECT DRAWINGS.
3. FOR TYPICAL DIMENSIONING CONVENTIONS, INCLUDING RULES FOR LOCATING DOORS FOR WHICH DIMENSIONS HAVE NOT BEEN SHOWN, REFER TO "ARCHITECTURAL DIMENSIONING CONVENTIONS" ON THIS SHEET.
4. FOR ILLUSTRATION AND DEFINITION OF TYPICAL SYMBOLS USED ON ARCHITECTURAL DRAWINGS, SEE "ARCHITECTURAL LEGEND" ON THIS SHEET.
5. ADDITIONAL SYMBOLS, NOT SHOWN OR DEFINED ON THIS SHEET MAY OCCUR AND ARE DEFINED ON OTHER ARCHITECTURAL DRAWINGS.
6. PROVIDE ISOLATION BETWEEN DISSIMILAR METALS AS REQUIRED TO PREVENT CORROSION / GALVANIC ACTION.
7. WATER RESISTANT GYPSUM BOARD (GREEN BOARD) SHALL BE USED IN ALL AREAS. DO NOT INSTALL A VAPOR BARRIER OR VAPOR RETARDER BEHIND GREEN BOARD. DO NOT INSTALL GREEN BOARD ON CEILINGS.
8. CEMENTIOUS BACKER BOARD SHALL BE INSTALLED AS SUBSTRATE UNDER TILE.
9. WORK SHALL COMPLY WITH THE PROVISIONS OF CHAPTER 33 OF THE CBC & CFC, "FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION".
10. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS WITH THOSE SHOWN ON DRAWINGS AND PROMPTLY REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO STARTING THE AFFECTED WORK.
11. CONTRACTOR SHALL FIELD VERIFY EXISTING STRUCTURAL MEMBERS AND NON-STRUCTURAL FINISHES PRIOR TO STARTING CONSTRUCTION. CONTRACTOR SHALL NOTIFY ARCHITECT OF RESULTS OF INVESTIGATION OF EXISTING CONDITIONS AND WAIT FOR DIRECTION FROM ARCHITECT BEFORE PROCEEDING. EXISTING STRUCTURAL MEMBERS CANNOT BE MODIFIED DURING CONSTRUCTION.

ARCHITECTURAL DIMENSIONING CONVENTIONS

1. EXCEPT WHERE DIRECTED TO PLACE ITEMS OF THE WORK AT THE "APPROXIMATE LOCATION SHOWN," DO NOT SCALE DRAWINGS FOR DIMENSIONAL INFORMATION. ALL ELEMENTS OF THE DRAWINGS MAY NOT BE DRAWN TO EXACT SCALE. ALL DIMENSIONS REQUIRED ARE SHOWN, OR MAY BE DERIVED FROM THOSE SHOWN, ON THE FLOOR PLANS, DETAIL PLANS, ELEVATIONS, SECTIONS, DETAILS, SCHEDULES, AND SPECIFICATIONS. SEE NOTES ON THIS SHEET AND SYMBOLS ON "ARCHITECTURAL SYMBOLS" DRAWING FOR DIMENSION CONVENTIONS USED ON THIS PROJECT.
2. EXCEPT WHERE SPECIFICALLY NOTED TO THE CONTRARY, ALL DIMENSIONS SHOWN ON THE ARCHITECTURAL DRAWINGS CONFORM TO THE FOLLOWING CONVENTIONS:
   - A. DIMENSIONS UTILIZING THE "CENTER LINE" SYMBOL ARE MEASURED TO:
     - STRUCTURAL OR DIMENSIONAL GRID LINES.
   - CENTER LINE OF CONCRETE OR CONCRETE MASONRY UNIT WALL (EXCLUSIVE OF APPLIED FINISHES HAVING THICKNESS OR FURRING). REFER TO THE ARCHITECTURAL PLANS AND SECTIONS, THE STRUCTURAL DRAWINGS, OR THE PARTITION SCHEDULE TO DETERMINE THE THICKNESS OF CONCRETE OR CONCRETE MASONRY UNIT WALLS.
   - CENTER LINE OF INTERIOR PARTITION ASSEMBLY (EXCLUSIVE OF APPLIED FINISHES HAVING THICKNESS WHICH MAY BE ADDED TO SUCH WALLS) AT PARTITIONS FRAMED WITH METAL STUDS. REFER TO "PARTITION SCHEDULE" TO DETERMINE THE THICKNESS OF EACH PARTITION ASSEMBLY TYPE.
   - CENTER LINE OF DOOR, WINDOW, OR LOUVER OPENING.
   - CENTER LINE OF EQUIPMENT OR FURNISHING.
   - CENTER LINE OF OTHER FEATURES AS INDICATED.
   - B. REFER TO SHEET A001 FOR ILLUSTRATION OF SYMBOL USED TO INDICATE CENTER LINE DIMENSION.
   - C. DIMENSIONS UTILIZING THE "FACE OF" SYMBOL ARE MEASURED TO:
     - FACE OF CONCRETE OR CONCRETE MASONRY UNIT WALL (EXCLUSIVE OF APPLIED FINISHES HAVING THICKNESS OR FURRING WHICH MAY BE ADDED TO SUCH WALLS).
     - FACE OF EXTERIOR STUDS (EXCLUSIVE OF APPLIED FINISHES HAVING THICKNESS WHICH MAY BE ADDED TO SUCH WALLS).
     - FACE OF INTERIOR PARTITIONS ASSEMBLY (EXCLUSIVE OF APPLIED FINISHES HAVING THICKNESS WHICH MAY BE ADDED TO SUCH WALLS) AS DEFINED BY THE PARTITION SCHEDULE, UNLESS NOTED AS A "FACE OF FINISH" OR "CLEAR" DIMENSION (SEE NOTES BELOW). DIMENSIONS ARE NOT MEASURED TO THE FACE OF APPLIED FINISH. REFER TO THE "PARTITION SCHEDULE" TO DETERMINE THE THICKNESS OF EACH PARTITION ASSEMBLY TYPE.
     - INSIDE EDGE OF FINISHED DOOR OPENING. REFER TO "DOOR SCHEDULE" FOR ADDITIONAL INFORMATION.
     - DIMENSION OR WORK POINT AS INDICATED ON RELATED ARCHITECTURAL DETAIL PLAN, SECTION, ELEVATION, CONFIGURATION DETAIL OR CONSTRUCTION DETAIL.
   - D. REFER TO SHEET A001 FOR ILLUSTRATION OF SYMBOL USED TO INDICATE "FACE OF" DIMENSION.
   - E. WHERE "FACE OF FINISH" OR "CLEAR" DIMENSIONS ARE SPECIFICALLY NOTED, DIMENSION IS MEASURED TO:
     - FINISH FACES AT THE MOST NARROW OR CONSTRICTED POINTS OF THE SECTION WHERE THE DIMENSION IS SHOWN WHEN THE DIMENSION OCCURS ACROSS AN OPEN SPACE. IN THIS CASE, A "FACE OF FINISH" DIMENSION IS EQUIVALENT TO A "CLEAR" DIMENSION.
     - FINISH FACES AT THE WIDEST OR MOST EXPANSIVE POINTS OF THE SECTION WHERE THE DIMENSION IS SHOWN WHEN THE DIMENSION OCCURS ACROSS AN OBJECT OR GROUP OF OBJECTS
   - F. WHERE "EQUAL" DIMENSIONS ARE USED ON REFLECTED CEILING PLANS TO LOCATE CEILING GRID WORK POINTS, MEASURE DIMENSIONS TO:
     - EDGE OF THE INDICATED CEILING AT THE FACE OF THE ADJACENT APPLIED FINISH MEASURED AT THE PLANE OF THE CEILING. CAUTION: DUE TO POSSIBLE APPLICATION OF APPLIED FINISHES WHOSE THICKNESS MAY VARY BETWEEN FLOOR AND CEILING AND WHOSE THICKNESS IS NOT ACCOUNTED FOR (EXCEPT AS INDICATED BY "FOF" OR "CLEAR" BY DIMENSIONS SHOWN ON THE FLOOR PLANS, THE CONTRACTOR MUST ADJUST, AS NECESSARY, THE FLOOR PLAN DIMENSIONS TO REFLECT CONDITIONS AT PLANE OF THE CEILING.



3. WHERE DIMENSIONS ARE NOT PROVIDED ON THE FLOOR PLANS TO LOCATE DOOR OPENINGS, APPLY THE FOLLOWING RULES, IN ORDER, TO DETERMINE THE LOCATION OF THE DOOR OPENINGS:
   - A. DOOR OPENINGS MAY BE DIMENSIONED ON DRAWINGS OTHER THAN THE FLOOR PLANS. REFER TO THE SECTIONS, ELEVATIONS, DETAILS, AND DOOR SCHEDULE NOTES FOR ADDITIONAL DIMENSIONAL INFORMATION
   - B. WHERE THE HINGE-SIDE OF A DOOR IS SHOWN ADJACENT TO A WALL, OR WALLS, PERPENDICULAR TO THE WALL IN WHICH THE DOOR OCCURS, LOCATE THE HINGE-SIDE FINISHED EDGE OF THE DOOR OPENING 4 INCHES FROM THE FACE (EXCLUSIVE OF ANY APPLIED FINISH) OF THE CLOSEST PERPENDICULAR WALL OR PARTITION ASSEMBLY.



4. WHERE INTERIOR PARTITIONS OF UNEQUAL THICKNESS ABUT, ALIGN EXPOSED FACES, UNLESS NOTED OTHERWISE.



5. ALL INTERIOR PARTITIONS SHOWN ON GRID LINE TO BE CENTERED ON GRID LINE, UNLESS NOTED OTHERWISE.
6. EXTERIOR CLADDING DIMENSIONS ARE TYPICALLY TO CENTER LINE OF COLUMN, JOINT, OR WINDOW MULLION UNLESS NOTED OTHERWISE.

DIMENSION SHOWN TO:
- CENTERLINE OF ASSEMBLY
- CENTER OF OPENING
- CENTERLINE OF EQUIPMENT/FURNISHINGS

DIMENSION SHOWN TO:
- PARTITION ASSEMBLY
- EDGE OF DOOR SWING
- OTHER ASSEMBLY
- WORK POINTS INDICATED ON DETAILS

7. WHERE WINDOWS OR DOOR DIMENSIONS ARE NOT SHOWN, CENTER THE OPENING ON INTERIOR FACE OF WALL.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

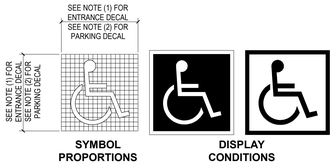
ABBREVIATIONS, SYMBOLS, AND CONVENTIONS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A000

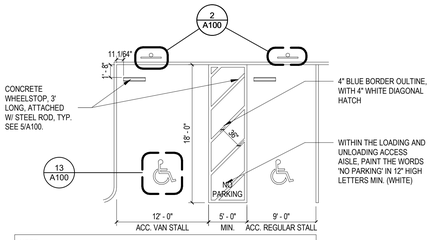
11/7/2024 3:15:39 PM



SYMBOL PROPORTIONS **DISPLAY CONDITIONS**

1. MINIMUM 5"x5" DECAL TO BE LOCATED BY PRIMARY ENTRANCE.
2. MINIMUM 36"x36" PAINTED SYMBOL ON PAVEMENT BEYOND ACCESSIBLE PARKING STALL(S).
3. CENTER EMBLEM AT ENTRANCE TO PARKING STALL
4. EMBLEM MUST BE LOCATED IN STALL SO THAT IT IS VISIBLE BY A TRAFFIC ENFORCEMENT OFFICER WHEN VEHICLE IS PROPERLY PARKED IN STALL
5. BACKGROUND TO BE BLUE, WHEELCHAIR SYMBOL TO BE WHITE (TYPICAL)
6. USE 2 COATS OF "TRAFFIC LINE" PAINT U.O.N.
7. PAINT COLORS SHALL BE AS REQUIRED BY THE ACCESSIBILITY REGULATIONS

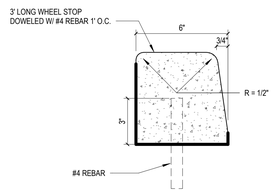
13 ACCESSIBILITY SYMBOL
3" = 1'-0"



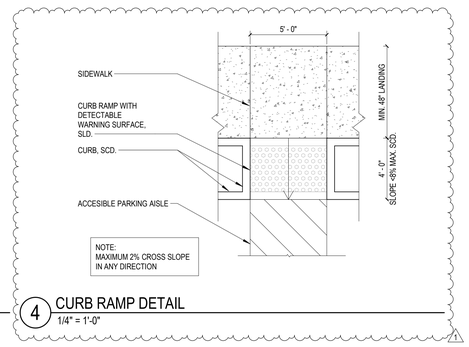
NOTE:
MAXIMUM 2% CROSS SLOPE IN ANY DIRECTION

GENERAL CONTRACTOR TO VERIFY ACCESSIBLE STALLS ARE IN COMPLIANCE WITH ADA & STATE DISABLED STDS

9 ENLARGED ACCESSIBLE PARKING
1/8" = 1'-0"



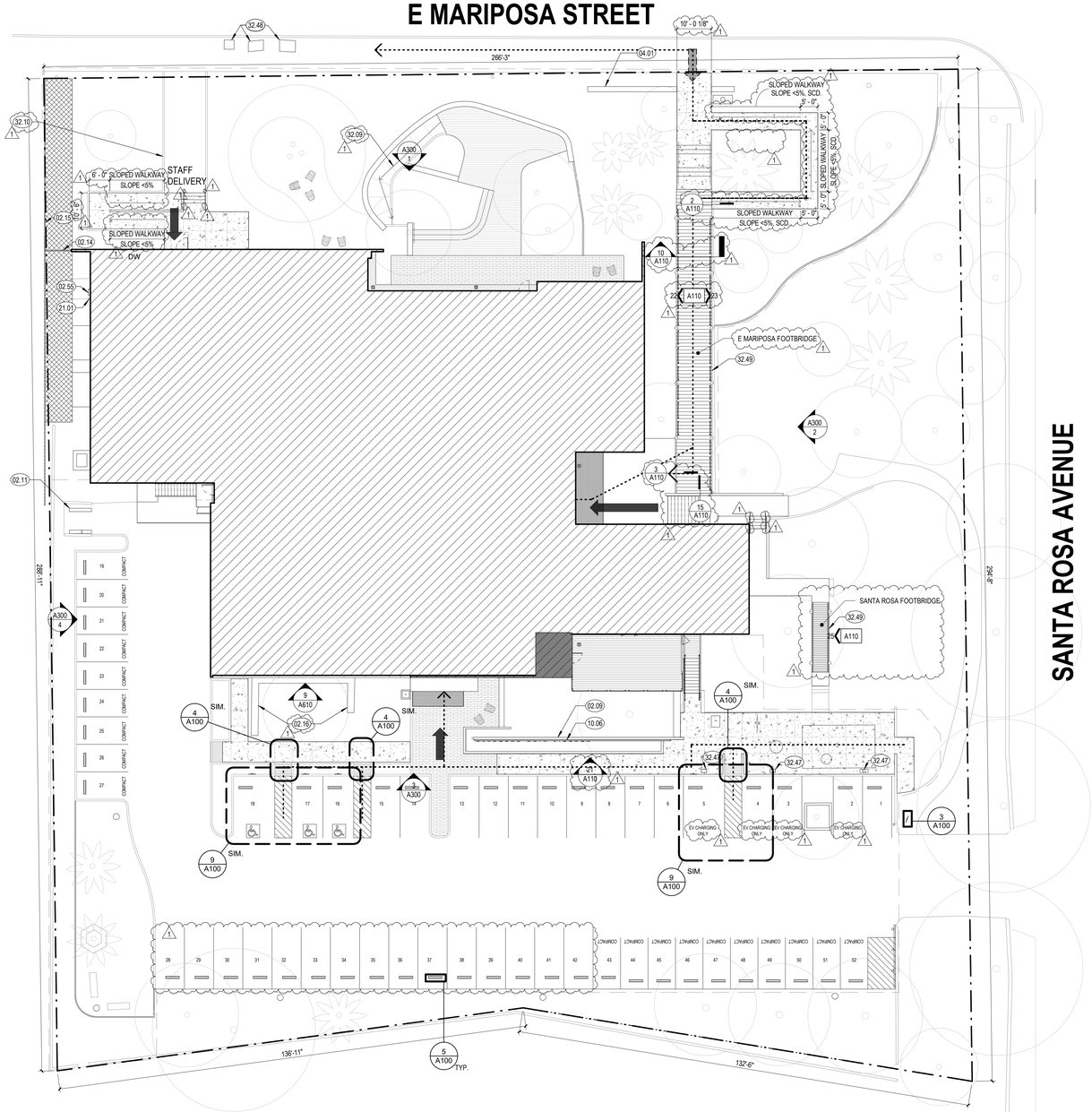
5 CURB STOP DETAIL
3" = 1'-0"



NOTE:
MAXIMUM 2% CROSS SLOPE IN ANY DIRECTION

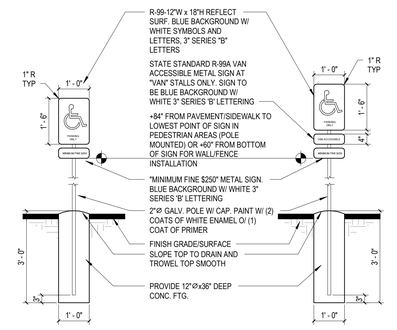
4 CURB RAMP DETAIL
1/4" = 1'-0"

E MARIPOSA STREET



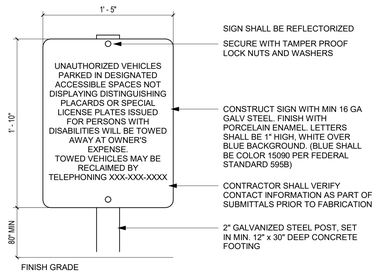
SANTA ROSA AVENUE

1 PROPOSED SITE PLAN
1/16" = 1'-0"



A - STANDARD ACCESSIBLE STALL B - VAN ACCESSIBLE STALL

2 ACCESSIBLE PARKING SIGNAGE
1/2" = 1'-0"



3 ACCESSIBLE PARKING TOW AWAY SIGNAGE
1 1/2" = 1'-0"

SHEET NOTES

A. SEE CIVIL DRAWINGS FOR SITE WORK AND SITE DEMOLITION WORK, INCLUDING TREE REMOVAL

B. SEE LANDSCAPE DRAWINGS FOR HARDSCAPE AND LANDSCAPE INFORMATION

C. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL RELATED SITE UTILITY WORK AND SITE LIGHTING

D. ACCESSIBLE PATH OF TRAVEL AS INDICATED ON THE PLAN IS A BARRIER-FREE ACCESS ROUTE WITHOUT ANY ABRUPT LEVEL CHANGES NOT EXCEEDING 1/4" MAX. AND AT LEAST 48" IN WIDTH. SURFACE IS STABLE, FIRM, AND SLIP RESISTANT. CROSS SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5%, OR RAMP LESS THAN 1:12 UNLESS OTHERWISE INDICATED. ACCESSIBLE PATH OF TRAVEL SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS TO 80" MINIMUM, AND PROTRUDING OBJECTS GREATER THAN 4" PROJECTION FROM WALL AND ABOVE 27" AND LESS THAN 80". ARCHITECT SHALL VERIFY THAT THERE ARE NO BARRIERS IN THE PATH OF TRAVEL

E. ALL PAVEMENT ALONG PATH OF TRAVEL IS CONCRETE.

KEYNOTES

02.09	(E) CMU WALL
02.11	(E) TRASH ENCLOSURE
02.14	(E) METAL GATE TO REMAIN
02.15	(E) CHAIN LINK FENCE TO REMAIN
1 02.16	(E) PARTIAL HEIGHT WALL
32.55	(E) ACCESS LADDER
04.01	ENTRY WALL AND SIGNAGE, S.L.D.
10.06	STAINLESS STEEL LETTERS. MOUNTED ON EXISTING CMU.
21.01	FIRE RISER
32.09	SLOPED WALKWAY, SLOPE <5% MAX. SCD.
1 32.10	ASPHALT PAVING, SLD.
32.47	EV CHARGING STATION, TO COMPLY WITH CBC CH 11B-812. SED.
32.48	BOOK DROP LOCATION
32.49	(E) FOOT BRIDGE TO BE REFURBISHED. SEE SHEET A110.

PARKING SPACES

		EXISTING BUILDING	PROPOSED BUILDING ADDITION	
			ENTRY LOBBY	TOTAL
AREA	MAIN LEVEL	17,337	-	17,337
	LOWER LEVEL	4,883	155	5,038
	TOTAL	22,220	155	22,375
PARKING	PARKING RATIO	1:444.4	1:250	1:438.8
	TOTAL	50	0.62	**50.62**
TOTAL NO. OF PARKING SPACES REQUIRED				**51**
TOTAL NO. OF PARKING SPACES PROVIDED				**52**
CBC TABLE 11B-208.2 MINIMUM NUMBER OF REQUIRED ACCESSIBLE PARKING SPACES (51-75) 3				PROVIDED 4 ** 1

** *CBC 11B-208.2.4 VAN PARKING SPACES - 1 PROVIDED ONE SPACE OUT OF SIX ACCESSIBLE SPACES PROVIDED SHALL BE A VAN PARKING SPACE COMPLYING WITH SECTION 11B-502.*

NOTE: NO EV SPACES REQUIRED PER CALGREEN CHAPTER 5.106.5.3

4 EV SPACES PROVIDED 1

BICYCLE PARKING

CODE OF ORDINANCES LA COUNTY BICYCLE PARKING. 22.112.100
SHORT TERM BICYCLE PARKING SHALL BE PROVIDED AT A RATE OF 1 SPACE FOR EVERY 50 INTENDED VISITORS BASED ON OCCUPANT LOAD OF THE LARGEST ASSEMBLY AREA WITHIN THE FACILITY, AND 1 LONG TERM SPACE FOR EVERY 100 INTENDED VISITORS BASED ON OCCUPANT LOAD OF THE LARGEST ASSEMBLY AREA WITHIN THE FACILITY.
COMMUNITY ROOM WITH LARGEST ASSEMBLY AREA HAS 185 OCCUPANTS:
- 6 SHORT TERM SPACES PROVIDED
- 2 LONG TERM SPACES PROVIDED

LEGEND

- PROPERTY LINE
- (E) BUILDING FOOTPRINT
- BUILDING ADDITION FOOTPRINT
- WALK OFF GRILLE, SCD.
- PATH, CHANGE IN LANDSCAPE OR HARDSCAPE
- STEPS/CHANGE IN LEVEL
- PARTIAL HEIGHT WALL
- PEDESTRIAN CONCRETE PAVING, SLD
- PRECAST CONCRETE PAVERS , SLD
- DECKING
- (E) EASEMENT
- WHEEL STOP
- BUILDING ENTRY
- PEDESTRIAN ACCESS
- ACCESSIBLE PATH OF TRAVEL

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024
SHEET TITLE:	

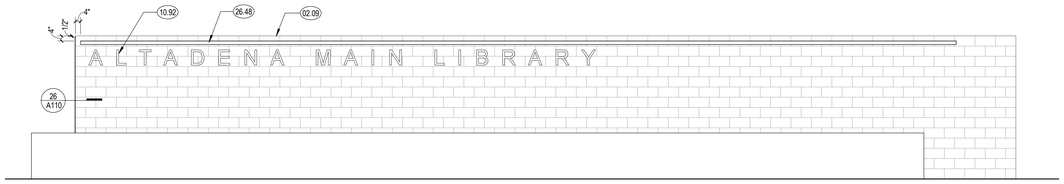
SITE PLAN

SCALE: As indicated

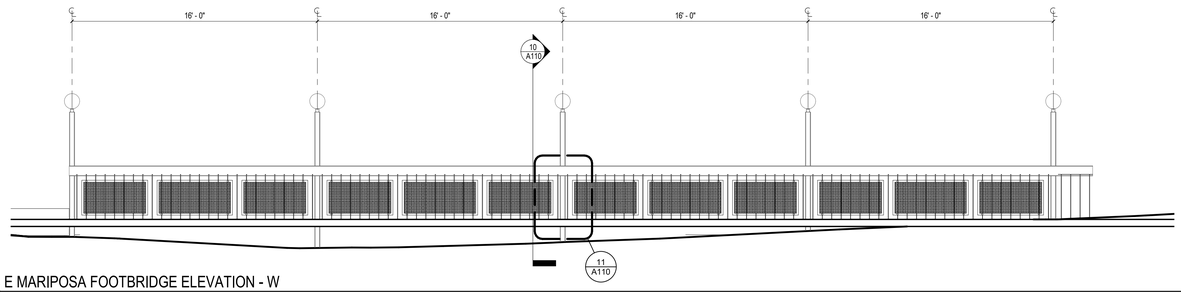
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

A100

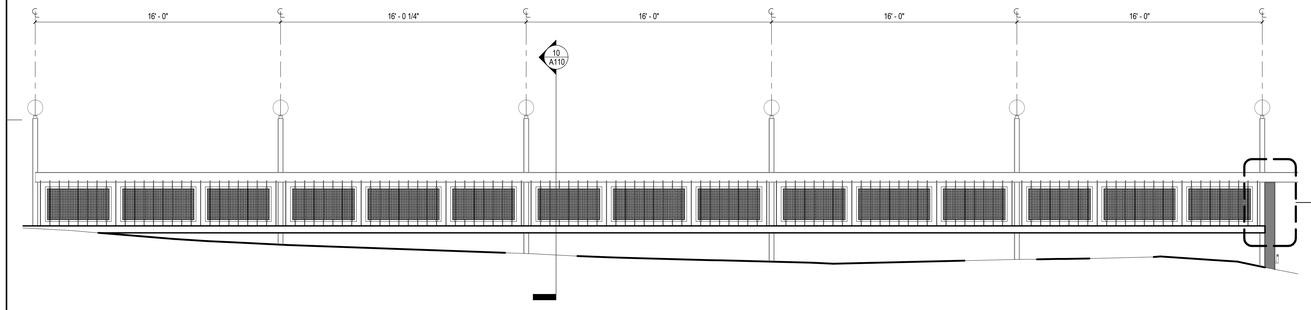
11/7/2024 5:47:34 PM



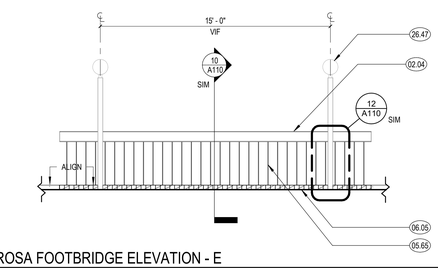
21 SOUTH SIGNAGE @ EXISTING CMU WALL
1/4" = 1'-0"



22 E MARIPOSA FOOTBRIDGE ELEVATION - W
1/4" = 1'-0"



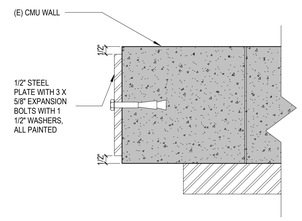
23 E MARIPOSA FOOTBRIDGE ELEVATION - E
1/4" = 1'-0"



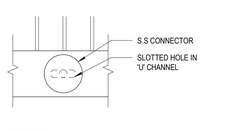
25 SANTA ROSA FOOTBRIDGE ELEVATION - E
1/4" = 1'-0"

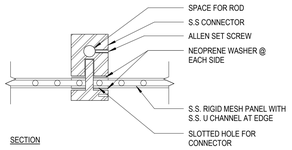


SANTA ROSA FOOTBRIDGE PHOTOS

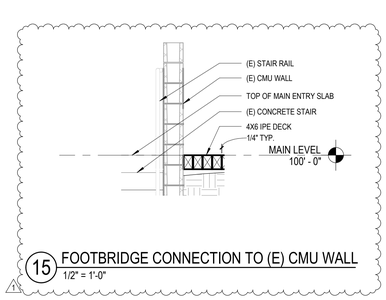


26 EDGE DETAIL @ EXISTING CMU WALL
3" = 1'-0"

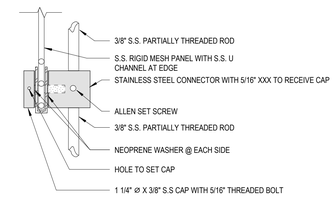




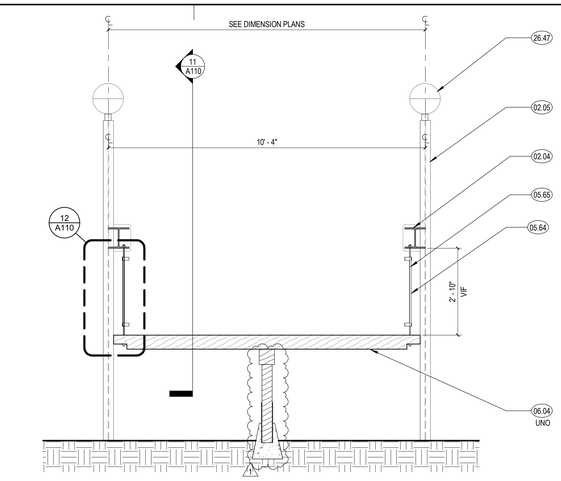
20 GUARDRAIL PANEL CONNECTORS
6" = 1'-0"



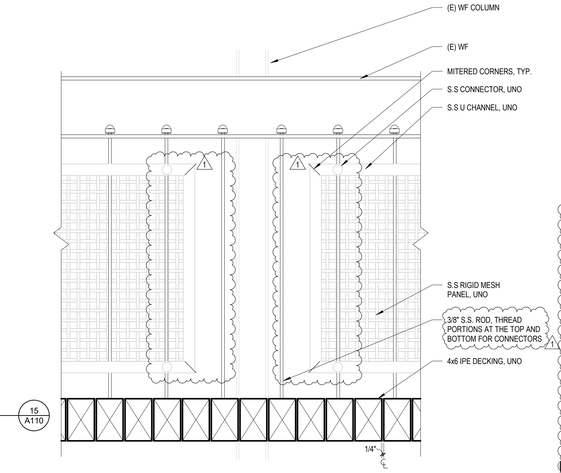
15 FOOTBRIDGE CONNECTION TO (E) CMU WALL
1/2" = 1'-0"



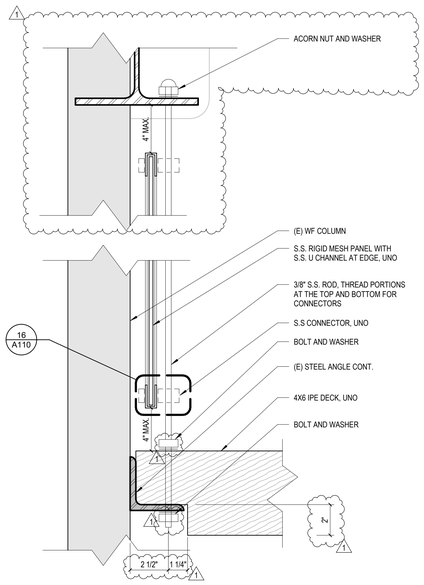
16 GUARDRAIL PANEL CONNECTORS
6" = 1'-0"



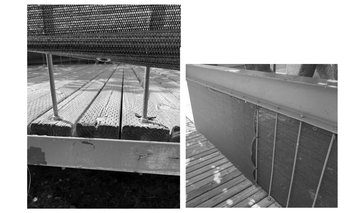
10 E MARIPOSA FOOTBRIDGE EAST - WEST SECTION
1/2" = 1'-0"



11 ELEVATION OF GUARDRAIL @ FOOTBRIDGE
1 1/2" = 1'-0"

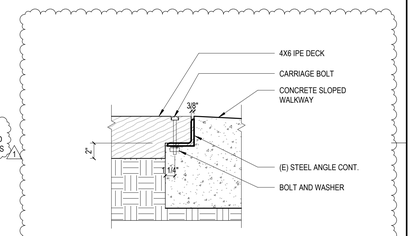


12 FOOTBRIDGE SECTION DETAIL @ ROD
3" = 1'-0"

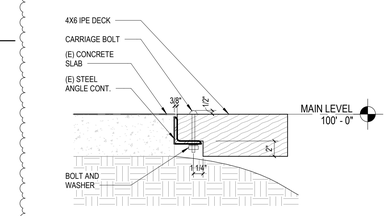




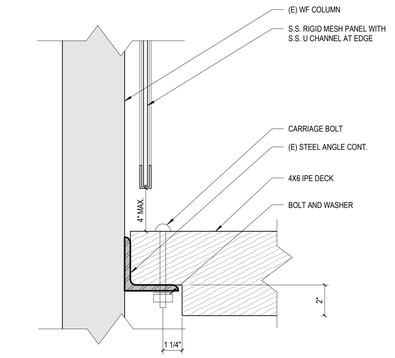
E MARIPOSA FOOTBRIDGE PHOTOS



2 CONCRETE SLOPED WALKWAY TO FOOTBRIDGE
1 1/2" = 1'-0"



3 FOOTBRIDGE TO (E) MAIN ENTRY SLAB
1 1/2" = 1'-0"



4 FOOTBRIDGE SECTION DETAIL WITHOUT ROD
3" = 1'-0"

KEYNOTES

02.04	(E) WF TO REMAIN IN PLACE. STRIP, PREP, AND PAINT
02.05	(E) WF LAMP POST TO REMAIN IN PLACE. STRIP, PREP, AND PAINT
02.09	(E) CMU WALL
05.64	S.S RIGID MESH PANEL, UNO
05.65	3/8" S.S. ROD, THREAD PORTIONS AT THE TOP AND BOTTOM FOR CONNECTORS
06.04	4X6 SEALED IPE WOOD
06.05	4X4 SEALED IPE WOOD
10.92	12" TALL ANODIZED ALUMINUM LETTERS, FLUSH MOUNTED. SIGN LETTER SHOWN AS SCHEMATIC INTENT ONLY. FINAL DESIGN TO BE DETERMINED AND SUBMITTED UNDER SEPARATE PERMIT.
26.47	(E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL
26.48	SURFACE MOUNTED UP/DOWN LIGHTING, SED. COORDINATE WITH LOCATION OF (E) J-BOX. VERIFY LOCATION WITH ARCHITECT BEFORE INSTALLING.

ABA

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

SITE DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A110

11/7/2024 3:15:50 PM

EXISTING PHOTOS



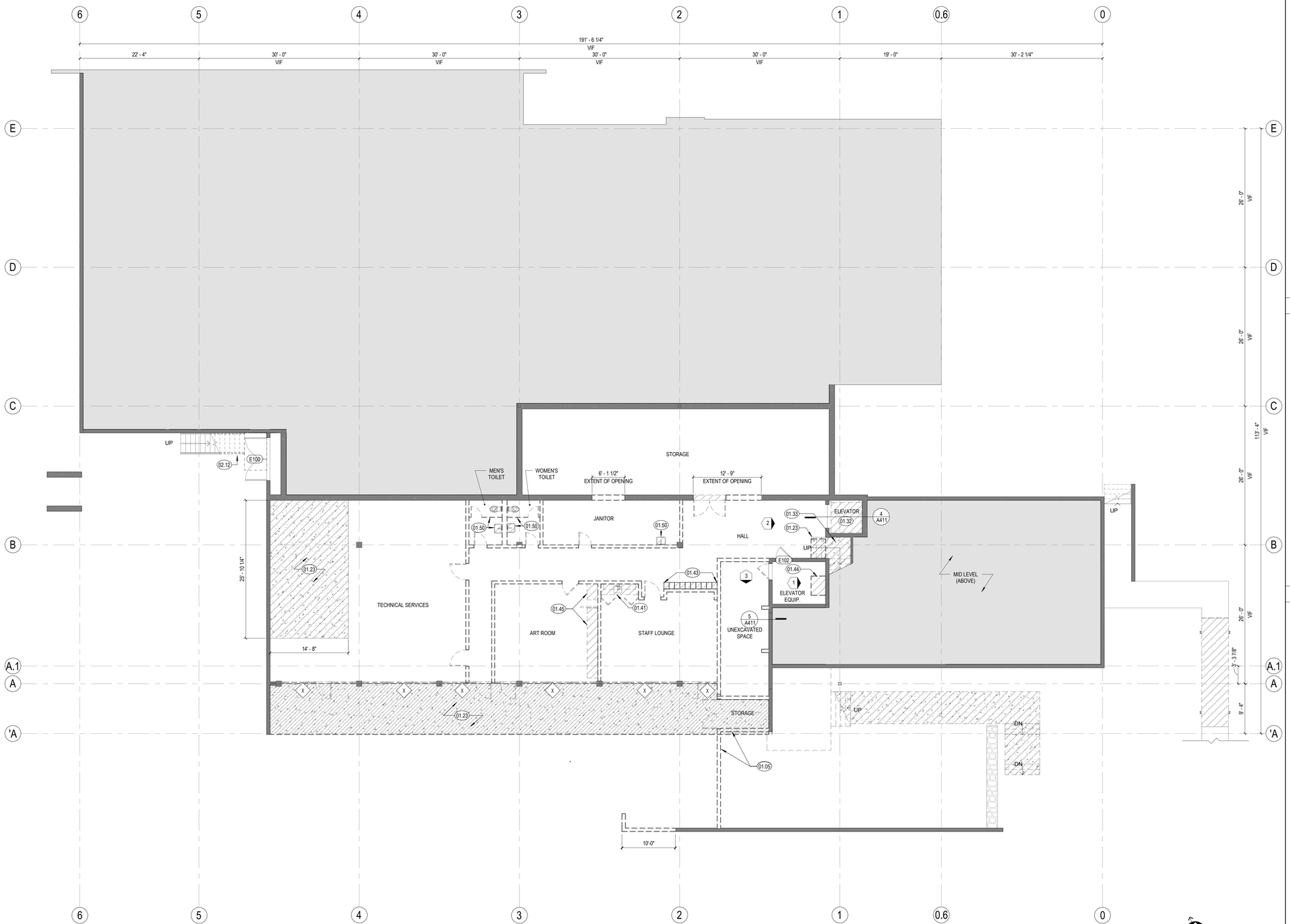
3 UNEXCAVATED SPACE



2 (E) ELEVATOR & STAIR



1 ELEVATOR CONTROL ROOM EQUIP.



2 DEMOLITION FLOOR PLAN - LOWER LEVEL
1/8" = 1'-0"

SHEET NOTES

1. EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND VISUAL FIELD SURVEYS. THE CONTRACTOR SHALL MAKE A DETAILED SURVEY OF THE EXISTING FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY FOUND BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ARCHITECT PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.
2. THE DEMOLITION PLAN DOES NOT ACKNOWLEDGE HAZARDOUS MATERIALS AND DOES NOT PROVE THE DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS. ALL HAZARDOUS MATERIALS DISCOVERED DURING THE FIELD INSPECTION AND DEMOLITION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER. ALL DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS SHALL BE IN CONFORMANCE WITH ALL LOCAL AND STATE CODES. ALL PERMITS AND APPROVALS SHALL BE OBTAINED AND COPIES PROVIDED TO THE OWNER FOR RECORD.
3. WHERE WALL FINISHES HAVE BEEN REMOVED AND EXISTING GYPSUM BOARD HAS BEEN DAMAGED, REPLACE AREA WITH NEW GYPSUM BOARD AS APPROPRIATE FOR NEW FINISHES AS SCHEDULED
4. REMOVE ALL (E) INTERIOR PARTITIONS AND DOORS, UNO.
5. REMOVE ALL PLUMBING FIXTURES, ACCESSORIES, AND EQUIPMENT, UNO.
6. SEE CIVIL DRAWINGS FOR ALL SITE DEMOLITION WORK
7. SEE STRUCTURAL DRAWINGS FOR ALL STRUCTURAL DEMOLITION WORK.
8. SEE MECHANICAL DRAWINGS FOR ALL MECHANICAL DEMOLITION WORK.
9. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL DEMOLITION WORK
10. SEE EXTERIOR ELEVATIONS, WALL SECTIONS, AND DETAILS FOR EXTENT OF EXTERIOR ENVELOPE DEMOLITION.
11. ALL FLOORING AT RESTROOMS SHALL BE REMOVED ALONG WITH RESPECTIVE MORTAR BED DOWN TO EXISTING RECESSED SLAB.
12. REMOVE AND SALVAGE ALL EXISTING PROJECTOR SCREENS, PROJECTORS, MONITORS AND COORDINATE STORAGE WITH DISTRICT
13. REMOVE EXISTING SHELVING AND CONFIRM SALVAGE MATERIALS PRIOR TO DEMOLITION
14. REMOVE (E) MILLWORK AND CASEWORK
15. REMOVE (E) FURNITURE AND CONFIRM ANY SALVAGE ITEMS WITH DISTRICT PRIOR TO REMOVAL
16. REMOVE (E) SIGNAGE AND SEE SPECIFICATIONS FOR PATCHPACK REQUIREMENTS
17. REMOVE ALL (E) FLOOR FINISHES, U.N.O.

KEYNOTES

01.05	DEMOLISH (E) RETAINING WALLS
01.23	DEMOLISH PORTION OF (E) CONCRETE SLAB.
01.32	DEMOLISH (E) ELEVATOR AND ALL ASSOCIATED EQUIPMENT/ACCESSORIES.
01.33	DEMOLISH (E) CONCRETE STAIR
01.41	DEMOLISH (E) KITCHENETTE
01.43	DEMOLISH (E) LOCKERS
01.44	DEMOLISH (E) ELEVATOR CONTROL ROOM EQUIPMENT
01.45	DEMOLISH (E) CASEWORK
01.50	DEMOLISH (E) PLUMBING FIXTURES AND RESTROOM PARTITIONS
02.12	(E) STAIRS TO REMAIN

LEGEND

- (E) WALL TO BE DEMOLISHED
- (E) FULL HT. WALL, TO REMAIN
- (E) REGION TO BE DEMOLISHED, SEE KEYNOTE FOR DESCRIPTION OF ELEMENTS TO BE DEMOLISHED.
- REGION OF (E) CONCRETE STAIRS OR SLAB TO BE DEMOLISHED
- EXISTING DOOR TO BE DEMOLISHED
- (E) ITEM TO BE DEMOLISHED
- X — (E) STOREFRONT TO BE DEMOLISHED AND REPLACED IN KIND (TYP) UNO. REFER TO FLOOR PLANS FOR ADDITIONAL INFORAMTION.
- PROTECT (E) TILE IN PLACE.
- # — EXISTING PHOTO REFERENCE
- E### — EXISTING (E) DOOR TO REMAIN

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

DEMO FLOOR PLAN - LOWER LEVEL

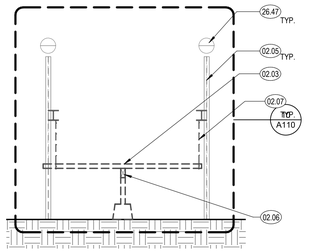
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

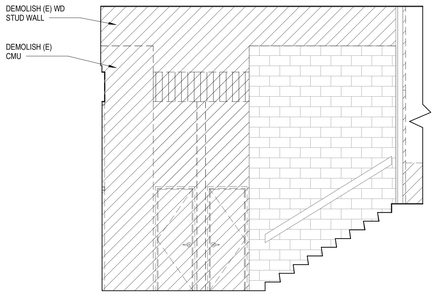
A160

11/7/2024 3:15:54 PM

DEMO ELEVATIONS & SECTIONS



4 FOOTBRIDGE EAST - DEMO SECTION
1/4" = 1'-0"



3 MID LEVEL LOBBY - DEMO ELEVATION
1/4" = 1'-0"



2 (E) ELEVATOR - DEMO ELEVATION
1/4" = 1'-0"

EXISTING PHOTOS



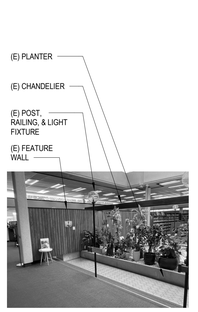
4 (E) HARDWOOD WALL PANELING



3 EXAMPLE OF (E) WOOD TILES TO PRESERVE



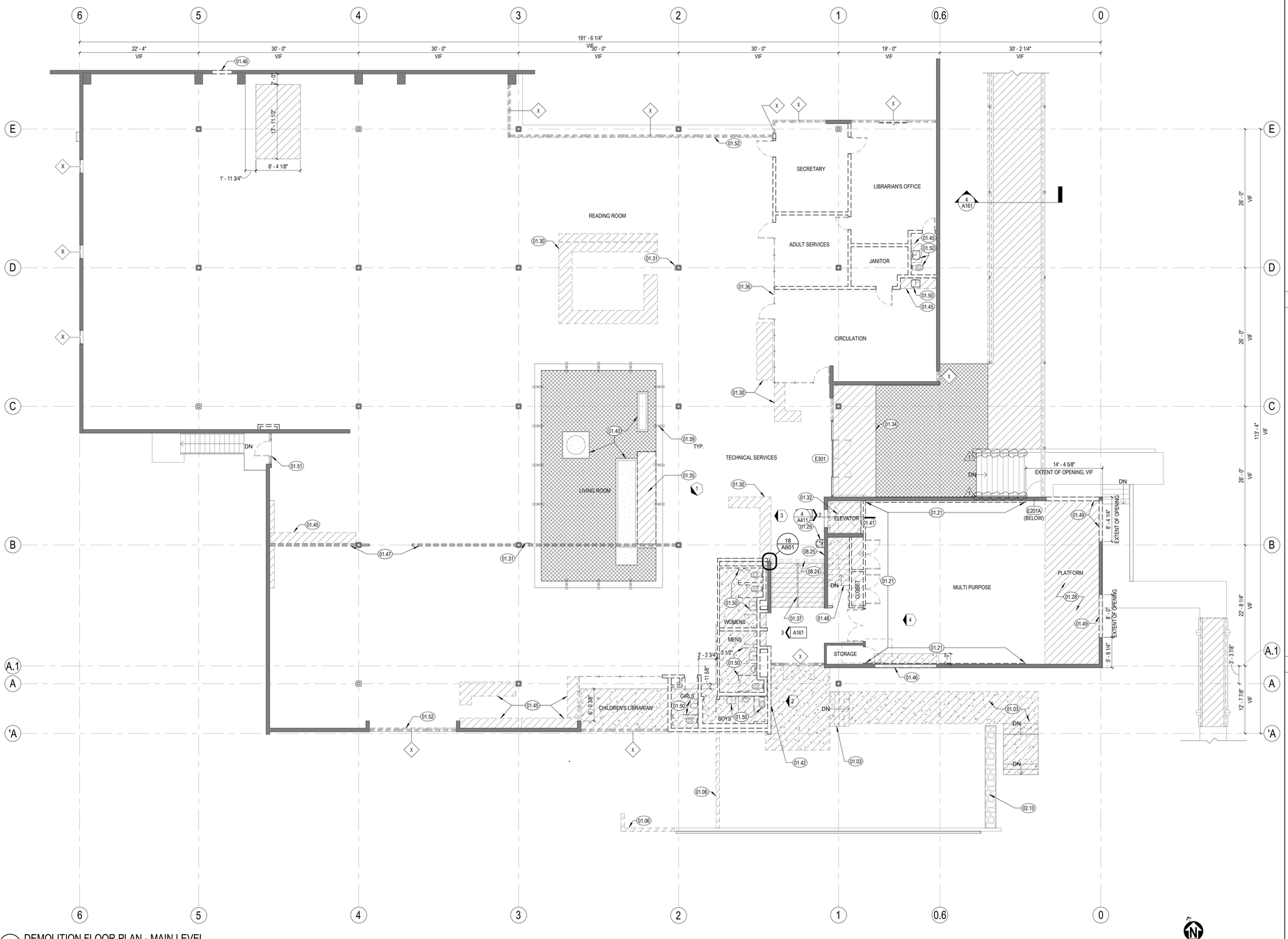
2 OWL SCULPTURE AND PLAQUE



1 LIVING ROOM

SHEET NOTES

1. EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND VISUAL FIELD SURVEYS. THE CONTRACTOR SHALL MAKE A DETAILED SURVEY OF THE EXISTING FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY FOUND BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ARCHITECT PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.
2. THE DEMOLITION PLAN DOES NOT ACKNOWLEDGE HAZARDOUS MATERIALS AND DOES NOT PROVE THE DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS. ALL HAZARDOUS MATERIALS DISCOVERED DURING THE FIELD INSPECTION AND DEMOLITION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER. ALL DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS SHALL BE IN CONFORMANCE WITH ALL LOCAL AND STATE CODES. ALL PERMITS AND APPROVALS SHALL BE OBTAINED AND COPIES PROVIDED TO THE OWNER FOR RECORD.
3. WHERE WALL FINISHES HAVE BEEN REMOVED AND EXISTING GYPSUM BOARD HAS BEEN DAMAGED, REPLACE AREA WITH NEW GYPSUM BOARD AS APPROPRIATE FOR NEW FINISHES AS SCHEDULED
4. REMOVE ALL (E) INTERIOR PARTITIONS AND DOORS, UNO.
5. REMOVE ALL PLUMBING FIXTURES, ACCESSORIES, AND EQUIPMENT, UNO.
6. SEE CIVIL DRAWINGS FOR ALL SITE DEMOLITION WORK.
7. SEE STRUCTURAL DRAWINGS FOR ALL STRUCTURAL DEMOLITION WORK.
8. SEE MECHANICAL DRAWINGS FOR ALL MECHANICAL DEMOLITION WORK.
9. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL DEMOLITION WORK
10. SEE EXTERIOR ELEVATIONS, WALL SECTIONS, AND DETAILS FOR EXTENT OF EXTERIOR ENVELOPE DEMOLITION.
11. ALL FLOORING AT RESTROOMS SHALL BE REMOVED ALONG WITH RESPECTIVE MORTAR BED DOWN TO EXISTING RECESSED SLAB.
12. REMOVE AND SALVAGE ALL EXISTING PROJECTOR SCREENS, PROJECTORS, MONITORS AND COORDINATE STORAGE WITH DISTRICT
13. REMOVE EXISTING SHELVING AND CONFIRM SALVAGE MATERIALS PRIOR TO DEMOLITION
14. REMOVE (E) MILLWORK AND CASEWORK
15. REMOVE (E) FURNITURE AND CONFIRM ANY SALVAGE ITEMS WITH DISTRICT PRIOR TO REMOVAL
16. REMOVE (E) SIGNAGE AND SEE SPECIFICATIONS FOR PATCHPACK REQUIREMENTS
17. REMOVE ALL (E) FLOOR FINISHES, U.N.O.



1 DEMOLITION FLOOR PLAN - MAIN LEVEL
1/8" = 1'-0"

KEYNOTES

01.03 DEMOLISH (E) CONCRETE STAIRS, WALKWAY, AND RAILINGS.
01.06 DEMOLISH (E) CMU WALLS
01.21 DEMOLISH (E) HARDWOOD WALL PANELING
01.28 DEMOLISH (E) PLATFORM, CURTAINS, AND PROJECTOR SCREEN
01.29 DEMOLISH (E) WATER FOUNTAIN
01.30 DEMOLISH (E) MILLWORK. PRESERVE WOOD TILES FOR REUSE. CONTRACTOR TO PHOTOGRAPH ALL TILES AND PROVIDE TO ARCHITECT FOR SELECTION AT SERVCE DESK. SEE SHEET A292 FOR ADDITIONAL INFORMATION.
01.31 (E) ELECTRICAL WALKER DUCTS TO REMAIN. DEMO (E) ELECTRICAL CONDUITS ALONG COLUMN AND REROUTE VIA IN-FLOOR DUCT SYSTEM TO ELECTRICAL PANEL. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
01.32 DEMOLISH (E) ELEVATOR AND ALL ASSOCIATED EQUIPMENT/ACCESSORIES.
01.34 DEMOLISH (E) FLOOR TILE
01.35 REMOVE (E) FLOOR TILE & ADHESIVE IN ITS ENTIRETY. PREP TO RECEIVE NEW FLOOR FINISHES. SEE FINISH PLANS FOR ADDITIONAL INFORMATION.
01.36 DEMOLISH (E) INTERIOR GLAZING SYSTEM AND WALL ABOVE AND BELOW.
01.37 (E) STAIR AND RAILING TO REMAIN. REMOVE CARPET, POLISH (E) CONCRETE STAIR. PROVIDE ALLOWANCE TO POLISH STAIRS.
01.39 REMOVE AND REINSTALL, OR PROTECT IN PLACE, POST, RAIL, AND LIGHT FIXTURE.
01.40 PROTECT PLANTERS
01.41 DEMOLISH (E) KITCHENETTE
01.42 REMOVE AND PROTECT EXISTING OWL SCULPTURE AND PLAQUE FOR REUSE
01.45 DEMOLISH (E) CASEWORK
01.46 DEMOLISH PORTION OF (E) WALL FOR DOOR, SSD.
01.47 DEMOLISH (E) FEATURE WALL
01.48 DEMOLISH (E) STAIRS
01.49 DEMOLISH PORTION OF (E) CMU WALL FOR WINDOW. SSD, A201 INTERIOR ELEVATIONS ON SHEET A522 AND EXTERIOR WINDOW TYPES SHEET A610.
01.50 DEMOLISH (E) PLUMBING FIXTURES AND RESTROOM PARTITIONS
01.51 DEMOLISH (E) DOOR AND SIDELITES
01.52 REMOVE (E) CHAIR RAIL AND SALVAGE FOR REUSE
02.03 (E) WOOD 4X4 DECKING TO BE DEMO'D
02.05 (E) WF LAMP POST TO REMAIN IN PLACE. STRIP, PREP, AND PAINT
02.06 (E) WD JOIST AND CONCRETE FOOTINGS TO BE DEMO'D
02.07 (E) THREADED RODS TO BE DEMO'D
02.10 (E) STONE WALL
08.24 (E) MOTORIZED COILING GRILLE TO REMAIN
08.25 (E) COILING GRILLE CONTROLS TO REMAIN
26.47 (E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL

LEGEND

- (E) WALL TO BE DEMOLISHED
- (E) FULL HT. WALL, TO REMAIN
- (E) REGION TO BE DEMOLISHED, SEE KEYNOTE FOR DESCRIPTION OF ELEMENTS TO BE DEMOLISHED.
- REGION OF (E) CONCRETE STAIRS OR SLAB TO BE DEMOLISHED
- EXISTING DOOR TO BE DEMOLISHED
- (E) ITEM TO BE DEMOLISHED
- (E) STOREFRONT TO BE DEMOLISHED AND REPLACED IN KIND (TYP) UNO. REFER TO FLOOR PLANS FOR ADDITIONAL INFORAMTION.
- PROTECT (E) TILE IN PLACE.
- EXISTING PHOTO REFERENCE
- EXISTING (E) DOOR TO REMAIN

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

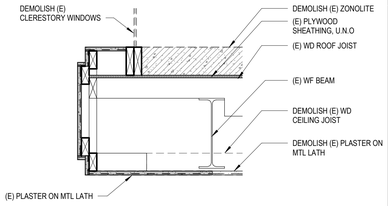
DEMO FLOOR PLAN - MAIN LEVEL

SCALE: As indicated

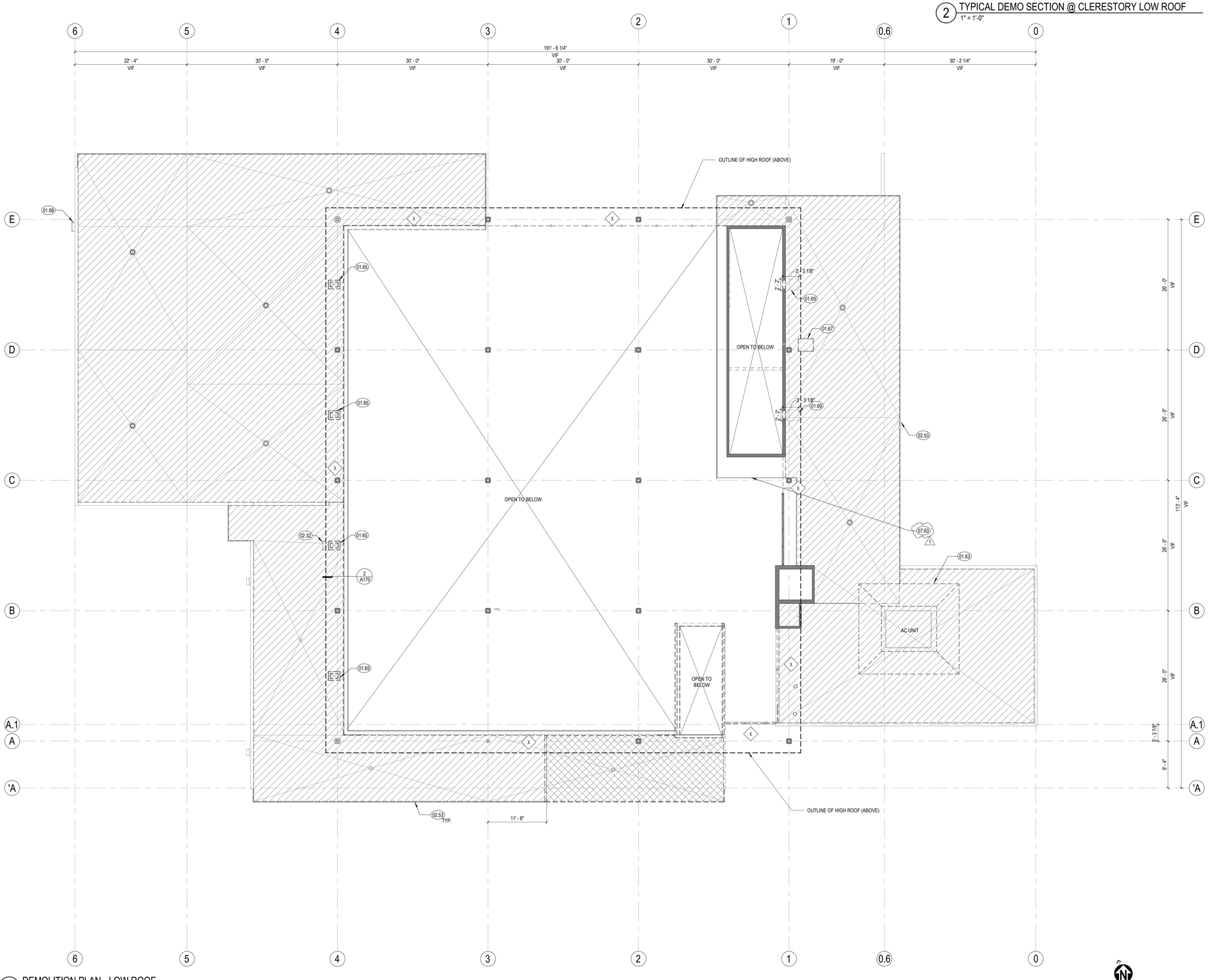
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A161

11/7/2024 5:49:47 PM



2 TYPICAL DEMO SECTION @ CLERESTORY LOW ROOF
1" = 1'-0"



1 DEMOLITION PLAN - LOW ROOF
1/8" = 1'-0"

SHEET NOTES

KEYNOTES

01.63 DEMOLISH (E) METAL CANOPY AND SUPPORT COLUMNS @ A.C UNITS
01.65 CONFIRM CLEARANCE AGAINST PROPOSED HVAC. PROVIDE ALLOWANCE FOR DEMOLITION.
01.67 (E) ROOF HATCH TO BE DEMOLISHED
01.68 (E) ACCESS LADDER, TO REMAIN.
01.69 DEMOLISH PORTION OF (E) ROOF FOR DUCT PENETRATIONS. SEE SHEET A210.
02.32 (E) ROOF LADDER TO REMAIN IN PLACE
02.53 (E) FASCIA TO BE PRESERVED IN PLACE
07.63 (E) LOWER ROOF STRUCTURE AT BUILDING INTERIOR TO REMAIN. SEE A180 FOR DEMO RCP.

LEGEND

(E) LIGHTWEIGHT INSULATING CONCRETE TO BE REMOVED DOWN TO (E) SUBSTRATE. (E) SUBSTRATE TO REMAIN UNLESS DAMAGED OR WATER LOGGED

(E) GLAZING & FRAME/CHANNEL TO BE DEMOLISHED

(E) ROOFING, INSULATION, SHEATHING, AND STRUCTURAL MEMEBERS TO BE DEMOLISHED

(E) ROOF DRAIN

EXISTING PHOTO REFERENCE

EXISTING WALL TO REMAIN

EXISTING WALL TO BE DEMOLISHED

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

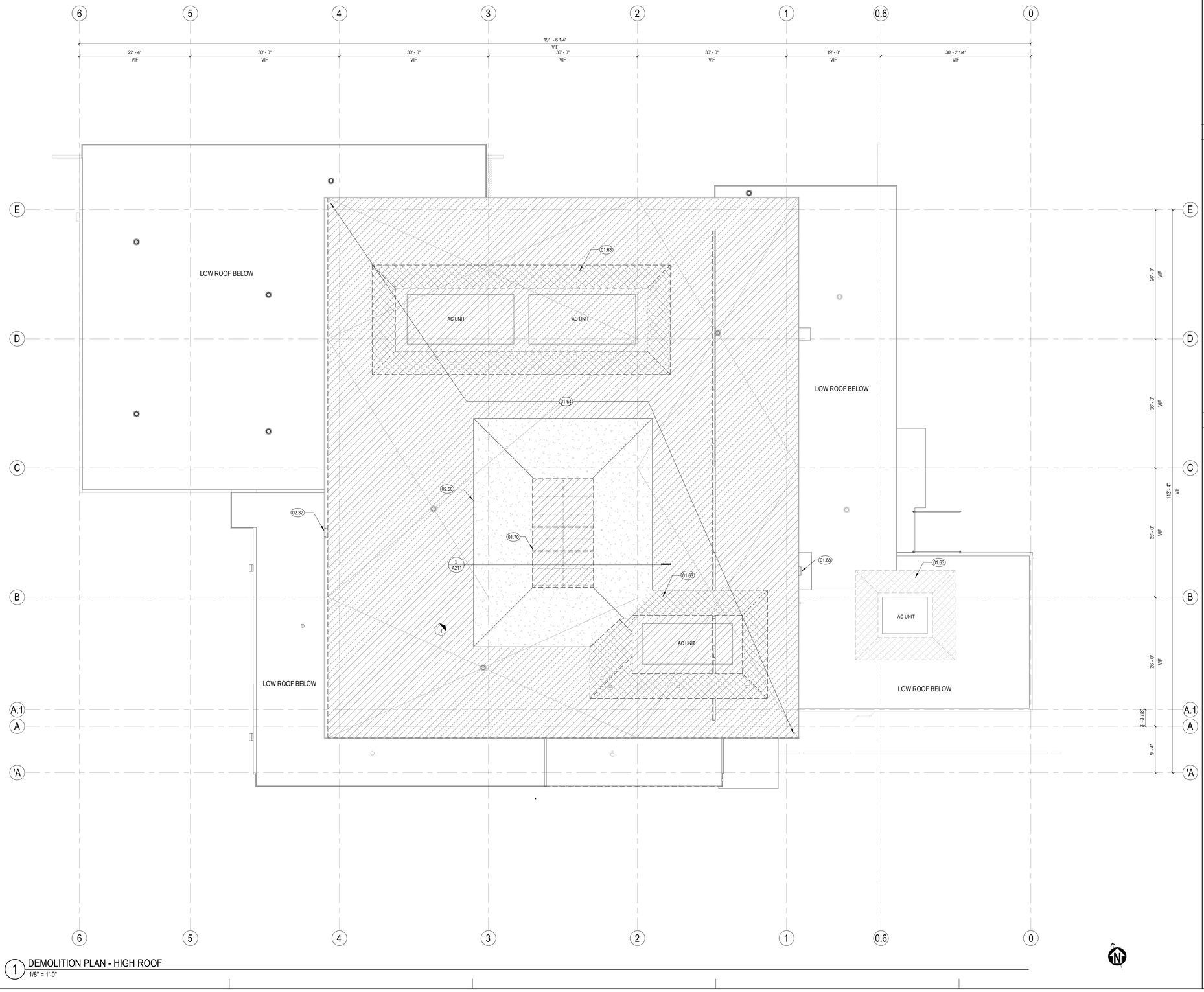
DEMO ROOF PLAN - LOW ROOF

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A170

11/7/2024 5:50:31 PM



1 DEMOLITION PLAN - HIGH ROOF
1/8" = 1'-0"

11/7/2024 4:22:00 PM

EXISTING PHOTOS



SHEET NOTES

KEYNOTES

01.63	DEMOLISH (E) METAL CANOPY AND SUPPORT COLUMNS @ A.C UNITS
01.64	DEMOLISH (E) ZONOLITE TO BE REPLACED WITH RIGID INSULATION AND PLYWOOD SHEATHING PER STRUCTURAL. (E) ROOF STRUCTURE TO BE PRESERVED IN PLACE.
01.68	(E) ACCESS LADDER, TO REMAIN.
01.70	(E) SKYLIGHT TO BE DEMOLISHED.
02.32	(E) ROOF LADDER TO REMAIN IN PLACE.
02.58	(E) SLOPED ROOFING TO REMAIN, SEE (E) PHOTO 1.

LEGEND

(E) LIGHTWEIGHT INSULATING CONCRETE TO BE REMOVED DOWN TO (E) SUBSTRATE. (E) SUBSTRATE TO REMAIN UNLESS DAMAGED OR WATER LOGGED

X (E) GLAZING & FRAME/CHANNEL TO BE DEMOLISHED

(E) ROOFING, INSULATION, SHEATHING, AND STRUCTURAL MEMEBERS TO BE DEMOLISHED

(E) ROOF DRAIN

EXISTING PHOTO REFERENCE

EXISTING WALL TO REMAIN

EXISTING WALL TO BE DEMOLISHED

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

DEMO ROOF PLAN - HIGH ROOF

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A171



1 DEMOLITION RCP - LOWER LEVEL
1/8" = 1'-0"

SHEET NOTES

1. EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND VISUAL FIELD SURVEYS. THE CONTRACTOR SHALL MAKE A DETAILED SURVEY OF THE EXISTING FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY FOUND BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ARCHITECT PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.
2. THE DEMOLITION PLAN DOES NOT ACKNOWLEDGE HAZARDOUS MATERIALS AND DOES NOT PROVE THE DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS. ALL HAZARDOUS MATERIALS DISCOVERED DURING THE FIELD INSPECTION AND DEMOLITION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER. ALL DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS SHALL BE IN CONFORMANCE WITH ALL LOCAL AND STATE CODES. ALL PERMITS AND APPROVALS SHALL BE OBTAINED AND COPIES PROVIDED TO THE OWNER FOR RECORD.
3. WHERE WALL FINISHES HAVE BEEN REMOVED AND EXISTING GYPSUM BOARD HAS BEEN DAMAGED, REPLACE AREA WITH NEW GYPSUM BOARD AS APPROPRIATE FOR NEW FINISHES AS SCHEDULED
4. REMOVE ALL PLUMBING FIXTURES, ACCESSORIES, AND EQUIPMENT, UNO.
5. SEE STRUCTURAL DRAWINGS FOR ALL STRUCTURAL DEMOLITION WORK.
6. SEE MECHANICAL DRAWINGS FOR ALL MECHANICAL DEMOLITION WORK.
7. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL DEMOLITION WORK.
8. SEE EXTERIOR ELEVATIONS, WALL SECTIONS, AND DETAILS FOR EXTENT OF EXTERIOR ENVELOPE DEMOLITION.
9. REMOVE AND SALVAGE ALL EXISTING PROJECTOR SCREENS, PROJECTORS, MONITORS AND COORDINATE STORAGE WITH DISTRICT
10. REMOVE EXISTING SHELVING AND CONFIRM SALVAGE MATERIALS PRIOR TO DEMOLITION
11. REMOVE (E) MILLWORK AND CASEWORK
12. REMOVE (E) FURNITURE AND CONFIRM ANY SALVAGE ITEMS WITH DISTRICT PRIOR TO REMOVAL
13. REMOVE (E) SIGNAGE AND SEE SPECIFICATIONS FOR PATCHPACK REQUIREMENTS
14. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
15. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.

KEYNOTES

02.56 (E) LOWER CEILING AREA
26.47 (E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL

LEGEND

- (E) GYPSUM BOARD AND FRAMING
- (E) PLASTER
- (E) EXPOSED CONCRETE
- (E) CONCRETE BEAM OR SLAB TO BE DEMOLISHED, SSD.
- (E) PLASTER CIELING TO BE DEMOLISHED
- (E) ACOUSTICAL CEILING TO BE DEMOLISHED
- (E) LIGHT FIXTURES TO BE DEMOLISHED
- (E) CURTAIN WALL, TO BE DEMOLISHED
- (E) WALL, TO BE DEMOLISHED
- (E) FULL HT. WALL, TO REMAIN
- (E) LOW HT. WALL, TO REMAIN
- (E) CONC. COLUMN
- (E) STOREFRONT TO BE DEMOLISHED AND REPLACED IN KIND. SEE FLOOR PLANS FOR ADDITIONAL INFORAMTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

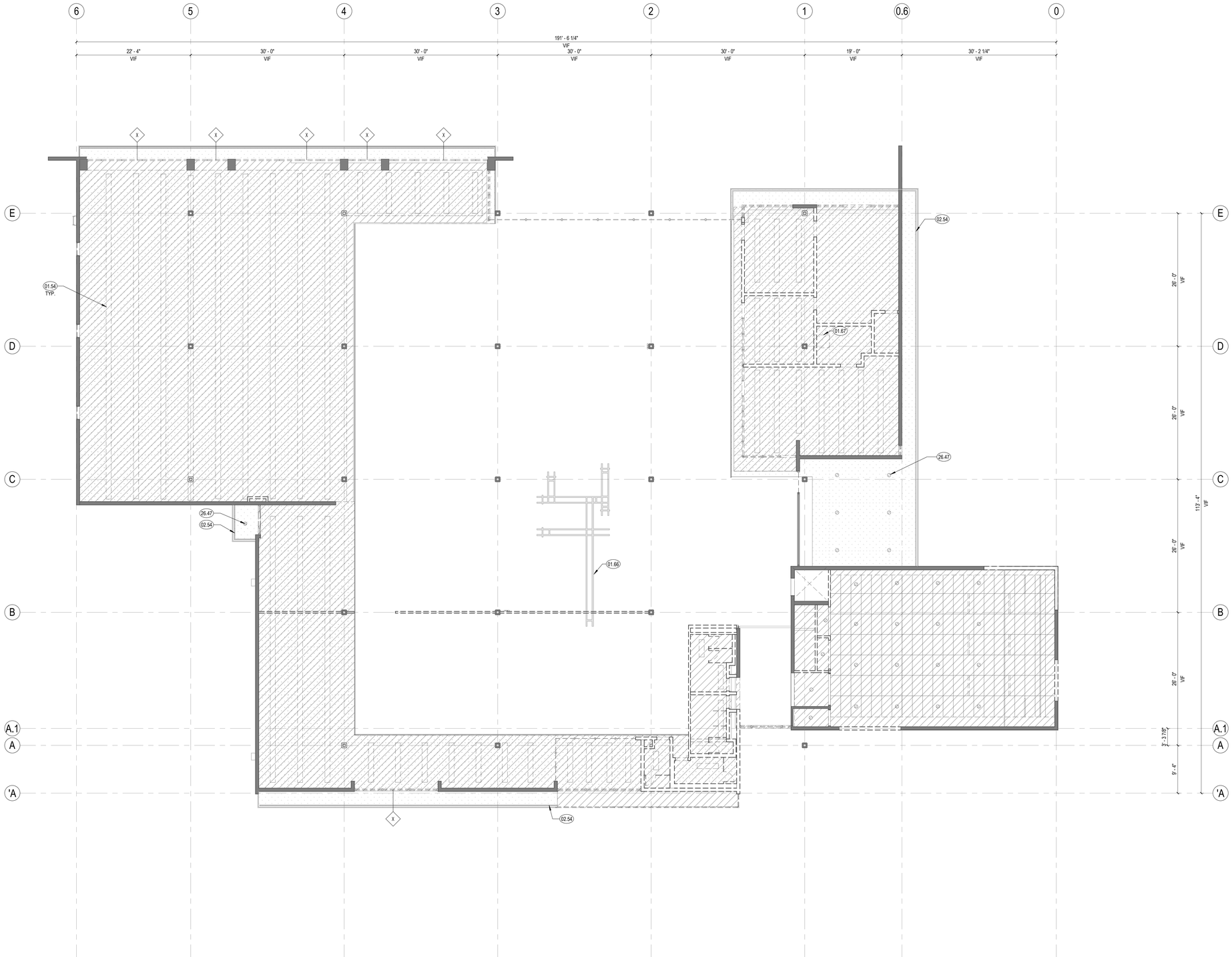
DEMO RCP - LOWER LEVEL

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A180

11/7/2024 5:53:05 PM



1 DEMOLITION RCP- MAIN LEVEL LOWER CEILING
1/8" = 1'-0"

11/7/2024 3:16:15 PM

SHEET NOTES

1. EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND VISUAL FIELD SURVEYS. THE CONTRACTOR SHALL MAKE A DETAILED SURVEY OF THE EXISTING FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY FOUND BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ARCHITECT PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.
2. THE DEMOLITION PLAN DOES NOT ACKNOWLEDGE HAZARDOUS MATERIALS AND DOES NOT PROVE THE DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS. ALL HAZARDOUS MATERIALS DISCOVERED DURING THE FIELD INSPECTION AND DEMOLITION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER. ALL DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS SHALL BE IN CONFORMANCE WITH ALL LOCAL AND STATE CODES. ALL PERMITS AND APPROVALS SHALL BE OBTAINED AND COPIES PROVIDED TO THE OWNER FOR RECORD.
3. WHERE WALL FINISHES HAVE BEEN REMOVED AND EXISTING GYPSUM BOARD HAS BEEN DAMAGED, REPLACE AREA WITH NEW GYPSUM BOARD AS APPROPRIATE FOR NEW FINISHES AS SCHEDULED
4. REMOVE ALL PLUMBING FIXTURES, ACCESSORIES, AND EQUIPMENT, UNO.
5. SEE STRUCTURAL DRAWINGS FOR ALL STRUCTURAL DEMOLITION WORK.
6. SEE MECHANICAL DRAWINGS FOR ALL MECHANICAL DEMOLITION WORK.
7. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL DEMOLITION WORK
8. SEE EXTERIOR ELEVATIONS, WALL SECTIONS, AND DETAILS FOR EXTENT OF EXTERIOR ENVELOPE DEMOLITION.
9. REMOVE AND SALVAGE ALL EXISTING PROJECTOR SCREENS, PROJECTORS, MONITORS AND COORDINATE STORAGE WITH DISTRICT
10. REMOVE EXISTING SHELVING AND CONFIRM SALVAGE MATERIALS PRIOR TO DEMOLITION
11. REMOVE (E) MILLWORK AND CASEWORK.
12. REMOVE (E) FURNITURE AND CONFIRM ANY SALVAGE ITEMS WITH DISTRICT PRIOR TO REMOVAL
13. REMOVE (E) SIGNAGE AND SEE SPECIFICATIONS FOR PATCHPACX REQUIREMENTS
14. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
15. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.

KEYNOTES

01.54	DEMOLISH (E) LIGHT FIXTURES
01.66	(E) CHANDELIER SUPPORTED BY WALL. PROVIDE SHORING OR REMOVE CHANDELIER AND REINSTALL. REPLACE LED LIGHTING AND LENS.
01.67	(E) ROOF HATCH TO BE DEMOLISHED
02.54	(E) 2" SOFFIT VENT
08.24	(E) MOTORIZED COILING GRILLE TO REMAIN
26.47	(E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL

LEGEND

- (E) GYPSUM BOARD AND FRAMING
- (E) PLASTER
- (E) EXPOSED CONCRETE
- (E) CONCRETE BEAM OR SLAB TO BE DEMOLISHED, SSD.
- (E) PLASTER CIELING TO BE DEMOLISHED
- (E) ACOUSTICAL CEILING TO BE DEMOLISHED
- (E) LIGHT FIXTURES TO BE DEMOLISHED
- (E) CURTAIN WALL, TO BE DEMOLISHED
- (E) WALL, TO BE DEMOLISHED
- (E) FULL HT. WALL, TO REMAIN
- (E) LOW HT. WALL, TO REMAIN
- (E) CONC. COLUMN
- X (E) STOREFRONT TO BE DEMOLISHED AND REPLACED IN KIND. SEE FLOOR PLANS FOR ADDITIONAL INFORAMTION

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

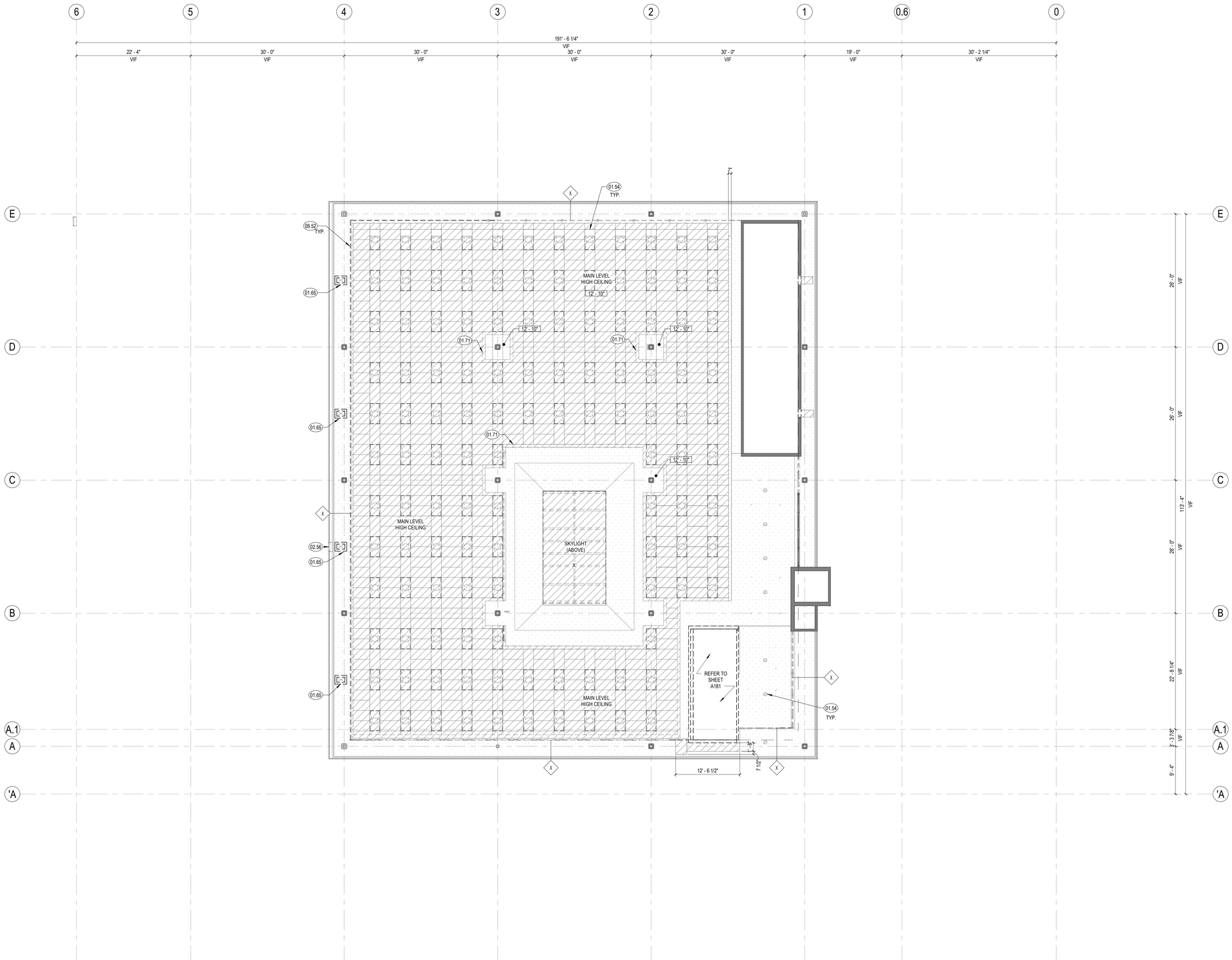
SHEET TITLE:

DEMO RCP - MAIN LEVEL LOWER CEILING

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A181



1 REFLECTED CEILING PLAN - MAIN LEVEL UPPER CEILING
1/8" = 1'-0"

SHEET NOTES

1. EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND VISUAL FIELD SURVEYS. THE CONTRACTOR SHALL MAKE A DETAILED SURVEY OF THE EXISTING FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY FOUND BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ARCHITECT PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.
2. THE DEMOLITION PLAN DOES NOT ACKNOWLEDGE HAZARDOUS MATERIALS AND DOES NOT PROVE THE DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS. ALL HAZARDOUS MATERIALS DISCOVERED DURING THE FIELD INSPECTION AND DEMOLITION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER. ALL DEMOLITION AND REMOVAL OF HAZARDOUS MATERIALS SHALL BE IN CONFORMANCE WITH ALL LOCAL AND STATE CODES. ALL PERMITS AND APPROVALS SHALL BE OBTAINED AND COPIES PROVIDED TO THE OWNER FOR RECORD.
3. WHERE WALL FINISHES HAVE BEEN REMOVED AND EXISTING GYPSUM BOARD HAS BEEN DAMAGED, REPLACE AREA WITH NEW GYPSUM BOARD AS APPROPRIATE FOR NEW FINISHES AS SCHEDULED
4. REMOVE ALL PLUMBING FIXTURES, ACCESSORIES, AND EQUIPMENT, UNO.
5. SEE STRUCTURAL DRAWINGS FOR ALL STRUCTURAL DEMOLITION WORK.
6. SEE MECHANICAL DRAWINGS FOR ALL MECHANICAL DEMOLITION WORK.
7. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL DEMOLITION WORK
8. SEE EXTERIOR ELEVATIONS, WALL SECTIONS, AND DETAILS FOR EXTENT OF EXTERIOR ENVELOPE DEMOLITION.
9. REMOVE AND SALVAGE ALL EXISTING PROJECTOR SCREENS, PROJECTORS, MONITORS AND COORDINATE STORAGE WITH DISTRICT
10. REMOVE EXISTING SHELVING AND CONFIRM SALVAGE MATERIALS PRIOR TO DEMOLITION
11. REMOVE (E) MILLWORK AND CASEWORK
12. REMOVE (E) FURNITURE AND CONFIRM ANY SALVAGE ITEMS WITH DISTRICT PRIOR TO REMOVAL
13. REMOVE (E) SIGNAGE AND SEE SPECIFICATIONS FOR PATCHPACK REQUIREMENTS
14. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
15. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.

KEYNOTES

01.54	DEMOLISH (E) LIGHT FIXTURES
01.65	CONFIRM CLEARANCE AGAINST PROPOSED HVAC. PROVIDE ALLOWANCE FOR DEMOLITION.
01.71	DEMOLISH (E) DIFFUSER.
02.56	(E) LOWER CEILING AREA
08.52	(E) CLERESTORY WINDOWS TO BE DEMOLISHED AND REPLACED IN KIND.

LEGEND

- (E) GYPSUM BOARD AND FRAMING
- (E) PLASTER
- (E) EXPOSED CONCRETE
- (E) CONCRETE BEAM OR SLAB TO BE DEMOLISHED, SSD.
- (E) PLASTER CIELING TO BE DEMOLISHED
- (E) ACOUSTICAL CEILING TO BE DEMOLISHED
- (E) LIGHT FIXTURES TO BE DEMOLISHED
- (E) CURTAIN WALL, TO BE DEMOLISHED
- (E) WALL, TO BE DEMOLISHED
- (E) FULL HT. WALL, TO REMAIN
- (E) LOW HT. WALL, TO REMAIN
- (E) CONC. COLUMN
- X (E) STOREFRONT TO BE DEMOLISHED AND REPLACED IN KIND. SEE FLOOR PLANS FOR ADDITIONAL INFORAMTION

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

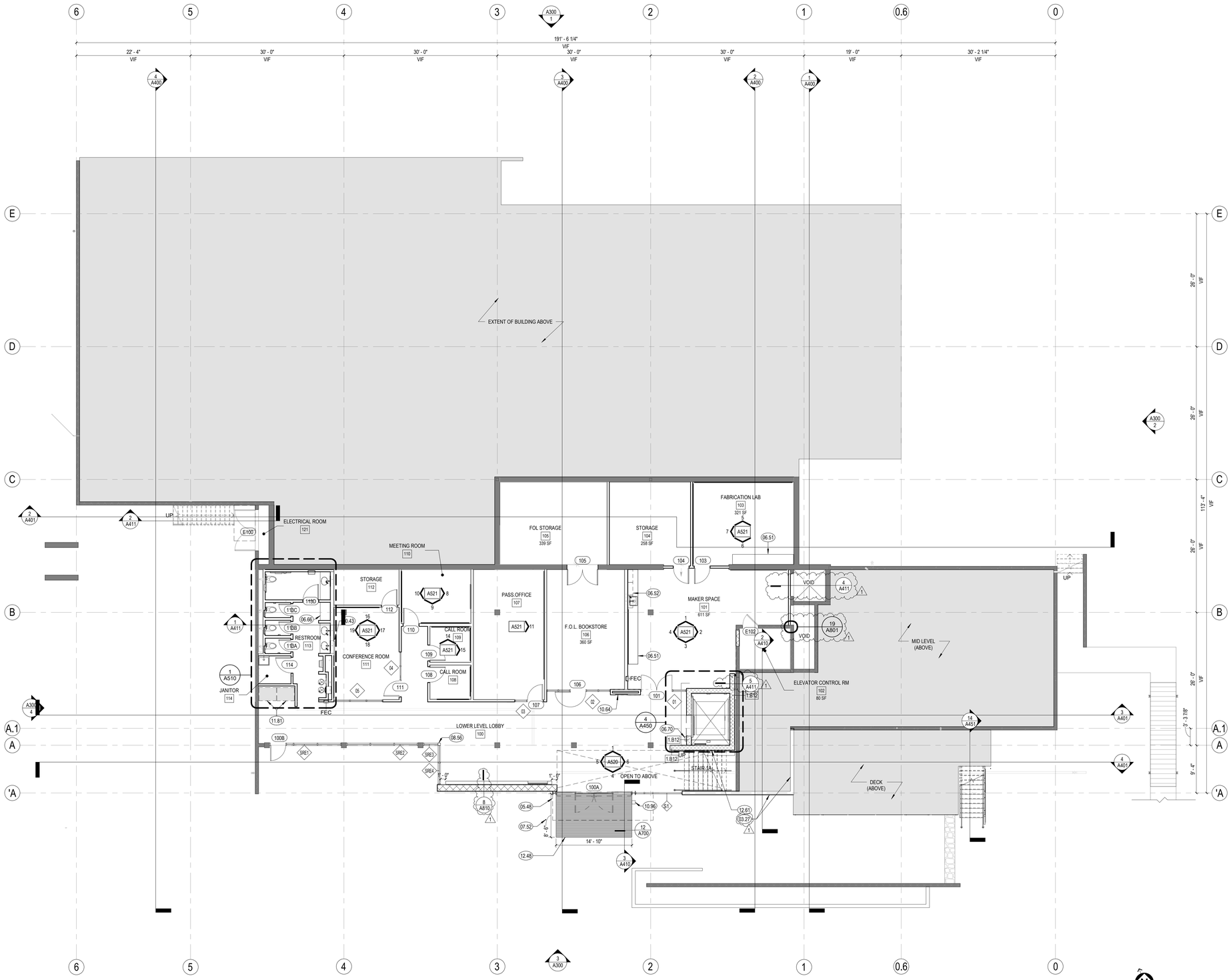
DEMO RCP - MAIN LEVEL UPPER CEILING

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A182

11/7/2024 3:16:18 PM



1 FLOOR PLAN - LOWER LEVEL
1/8" = 1'-0"

11/7/2024 3:16:22 PM

FLOOR PLAN SHEET NOTES

A. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
B. PROVIDE ACCESS PANELS AS REQUIRED PER APPLICABLE CODES FOR MAINTENANCE ACCESS TO INSTALLED MEP EQUIPMENT. PROVIDE STAINLESS STEEL ACCESS PANELS AT CERAMIC TILE LOCATIONS. COORDINATE TYPES AND LOCATIONS OF WALL ACCESS PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
C. MATCH EXISTING STUD DIMENSION WHERE NEW PARTITION FRAMING ALIGNS WITH EXISTING PARTITION. STUD SIZE INDICATED IN WALL TYPE SHALL BE VERIFIED BY CONTRACTOR AT THESE CONDITIONS.
D. ADJACENT IN-LINE PARTITIONS OF DIFFERENT TYPES SHALL BE CONSTRUCTED SUCH THAT EXPOSED FINISH SURFACES ARE FLUSH AND CONTINUOUS.
E. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.
F. FOR WALLS BUTTING INTO EXTERIOR WINDOWS, SEE 13 / A801

KEYNOTES

03.27 CONCRETE STRUCTURAL WALL, SSD.
05.48 OUTLINE OF CANOPY (ABOVE). SEE 2/A210
06.51 BASE CABINETS. SEE ELEVATIONS ON A520-A526.
06.52 UPPER CABINETS. SEE ELEVATIONS ON A520-A526.
06.66 SOLID SURFACE COUNTERTOP
06.70 ELEVATOR CALL BOX OUT. SEE DETAIL 22/A451.
07.52 RAIN CHAIN
08.56 STOREFRONT INTERNAL CORNER MULLION
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.
10.64 DIGITAL DISPLAY
10.96 BIBLIOTHECA SECURED ENTRANCE KEYPAD SYSTEM
11.81 VENDING MACHINE, OFOI.
12.48 ENTRANCE FLOOR GRILLE, SEE EXTERIOR DETAILS ON SHEET A700 AND SCD.
12.61 INSTALL SALVAGED (E) OWL SCULPTURE. DIMENSION IN FIELD AND SUBMIT INSTALLATION SHOP DRAWINGS. SEE A161 FOR ADDITIONAL INFORMATION.

LEGEND

- INTERIOR AND EXTERIOR SOFFITS ABOVE
- PARTITION, SEE PARTITION TYPES ON SHEET A800
- CMU WALL, SEE PARTITION TYPES ON SHEET A800
- 1-HR RATED STUD WALL, SEE PARTITION TYPES ON SHEET A800
- EXISTING (E) WALL TO REMAIN
- F1.AH — WALL TAG, SEE PARTITION TYPES ON SHEET A800
- ### — DOOR TAG, SEE DOOR TYPES, FRAME TYPES, AND SCHEDULES ON SHEET A600
- E### — EXISTING (E) DOOR TO REMAIN
- S# — WINDOW TAG, SEE WINDOW TYPES ON SHEETS A610 AND A611
- SRE# — STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND, UNO. SEE WINDOW TYPES ON SHEETS A610 AND A611

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

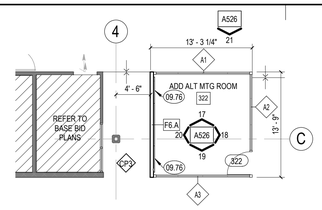
SHEET TITLE:

FLOOR PLAN - LOWER LEVEL

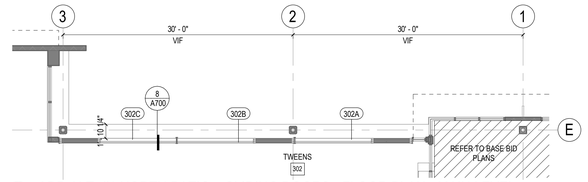
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

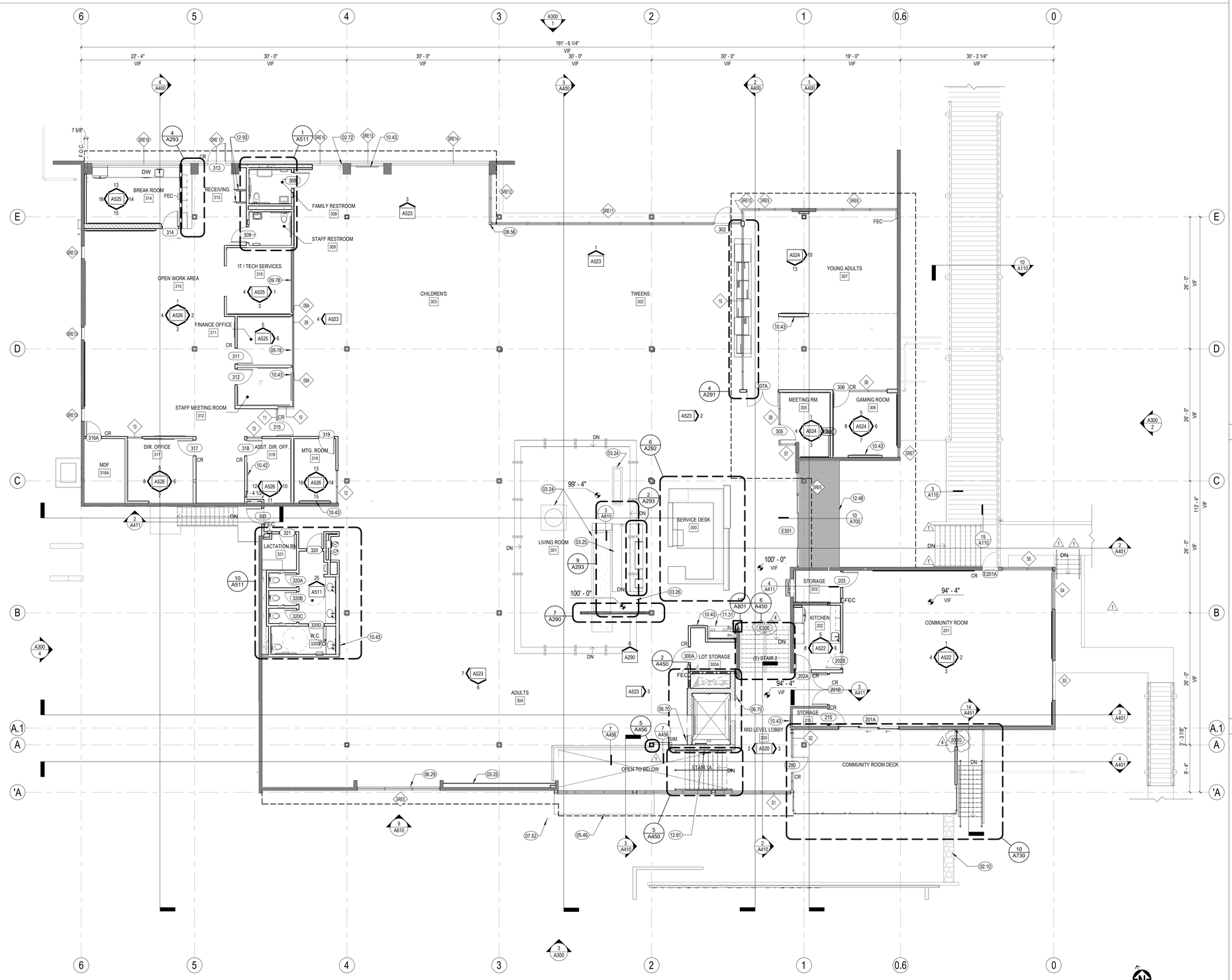
A200



2 ADD ALT. #2 MEETING ROOM ADDITION - FLOOR PLAN - MAIN LEVEL
1/8" = 1'-0"



3 ADD ALT. #1 NORTH PATIO + SLIDING DOORS - FLOOR PLAN - MAIN LEVEL
1/8" = 1'-0"



1 FLOOR PLAN - MAIN LEVEL
1/8" = 1'-0"

FLOOR PLAN SHEET NOTES

A. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
B. PROVIDE ACCESS PANELS AS REQUIRED PER APPLICABLE CODES FOR MAINTENANCE ACCESS TO INSTALLED MEP EQUIPMENT. PROVIDE STAINLESS STEEL ACCESS PANELS AT CERAMIC TILE LOCATIONS. COORDINATE TYPES AND LOCATIONS OF WALL ACCESS PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
C. MATCH EXISTING STUD DIMENSION WHERE NEW PARTITION FRAMING ALIGNS WITH EXISTING PARTITION. STUD SIZE INDICATED IN WALL TYPE SHALL BE VERIFIED BY CONTRACTOR AT THESE CONDITIONS.
D. ADJACENT IN-LINE PARTITIONS OF DIFFERENT TYPES SHALL BE CONSTRUCTED SUCH THAT EXPOSED FINISH SURFACES ARE FLUSH AND CONTINUOUS.
E. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.
F. FOR WALLS BUTTING INTO EXTERIOR WINDOWS, SEE 13 / A801

KEYNOTES

02.10 (E) STONE WALL
02.59 (E) WALL BELOW
02.72 (E) RAIN WATER LEADER
03.24 EXISTING CONCRETE PLANTERS
03.25 SLOPED CONCRETE WALKWAY
03.26 CONCRETE INFILL
05.46 OUTLINE OF CANOPY (BELOW). SEE 2/A210
06.29 SALVAGED CHAIR RAIL
06.70 ELEVATOR CALL BOX OUT. SEE DETAIL 22/A451.
07.52 RAIN CHAIN
08.56 STOREFRONT INTERNAL CORNER MULLION
09.76 ACOUSTICAL WALL PANEL
09.78 TACKABLE ACOUSTIC PANEL, 1" THICK. NRC .75 MIN UNO.
10.42 PORCELAIN MARKERBOARD
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.
11.31 LAPTOP KIOSK, OFOI
12.48 ENTRANCE FLOOR GRILLE. SEE EXTERIOR DETAILS ON SHEET A700 AND SCD.
12.61 INSTALL SALVAGED (E) OWL SCULPTURE. DIMENSION IN FIELD AND SUBMIT INSTALLATION SHOP DRAWINGS. SEE A161 FOR ADDITIONAL INFORMATION.
12.93 SURFACE MOUNTED BICYCLE RACK.

LEGEND

- INTERIOR AND EXTERIOR SOFFITS ABOVE
- PARTITION, SEE PARTITION TYPES ON SHEET A800
- CMU WALL, SEE PARTITION TYPES ON SHEET A800
- 1-HR RATED STUD WALL, SEE PARTITION TYPES ON SHEET A800
- EXISTING (E) WALL TO REMAIN
- F1.AH — WALL TAG, SEE PARTITION TYPES ON SHEET A800
- ### — DOOR TAG, SEE DOOR TYPES, FRAME TYPES, AND SCHEDULES ON SHEET A600
- E### — EXISTING (E) DOOR TO REMAIN
- S# — WINDOW TAG, SEE WINDOW TYPES ON SHEETS A610 AND A611
- SRE# — STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND, UNO. SEE WINDOW TYPES ON SHEETS A610 AND A611

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT — MARK SCHOEMAN — No. C-19562 — REN. 03-31-25 — STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
4	06/13/2025	FIRE PLAN BACKCHECK

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

FLOOR PLAN - MAIN LEVEL

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A201

6/13/2025 8:38:21 PM



1 DIMENSION PLAN - LOWER LEVEL
1/8" = 1'-0"

11/7/2024 3:16:35 PM

DIMENSION PLAN SHEET NOTES

A. ALL DIMENSIONS ARE TO FACE OF STUD OR CENTERLINE AS DESCRIBED ON SHEET A000, U.N.O

LEGEND

- INTERIOR AND EXTERIOR SOFFITS ABOVE
- PARTITION, SEE PARTITION TYPES ON SHEET A800
- CMU WALL, SEE PARTITION TYPES ON SHEET A800
- 1-HR MIN. RATED CMU WALL, SEE PARTITION TYPES ON SHEET A800
- 1-HR RATED STUD WALL, SEE PARTITION TYPES ON SHEET A800
- EXISTING (E) WALL TO REMAIN
- F1.AH — WALL TAG, SEE PARTITION TYPES ON SHEET A800
- CONCRETE SLAB INFILL, SSD

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

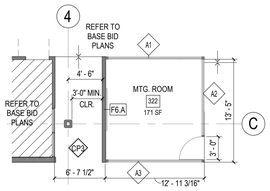
SHEET TITLE:

DIMENSION PLAN - LOWER LEVEL

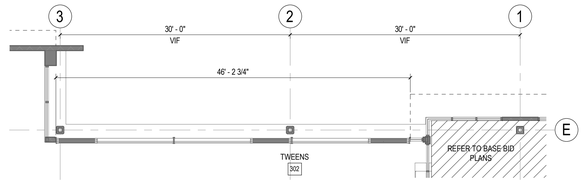
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

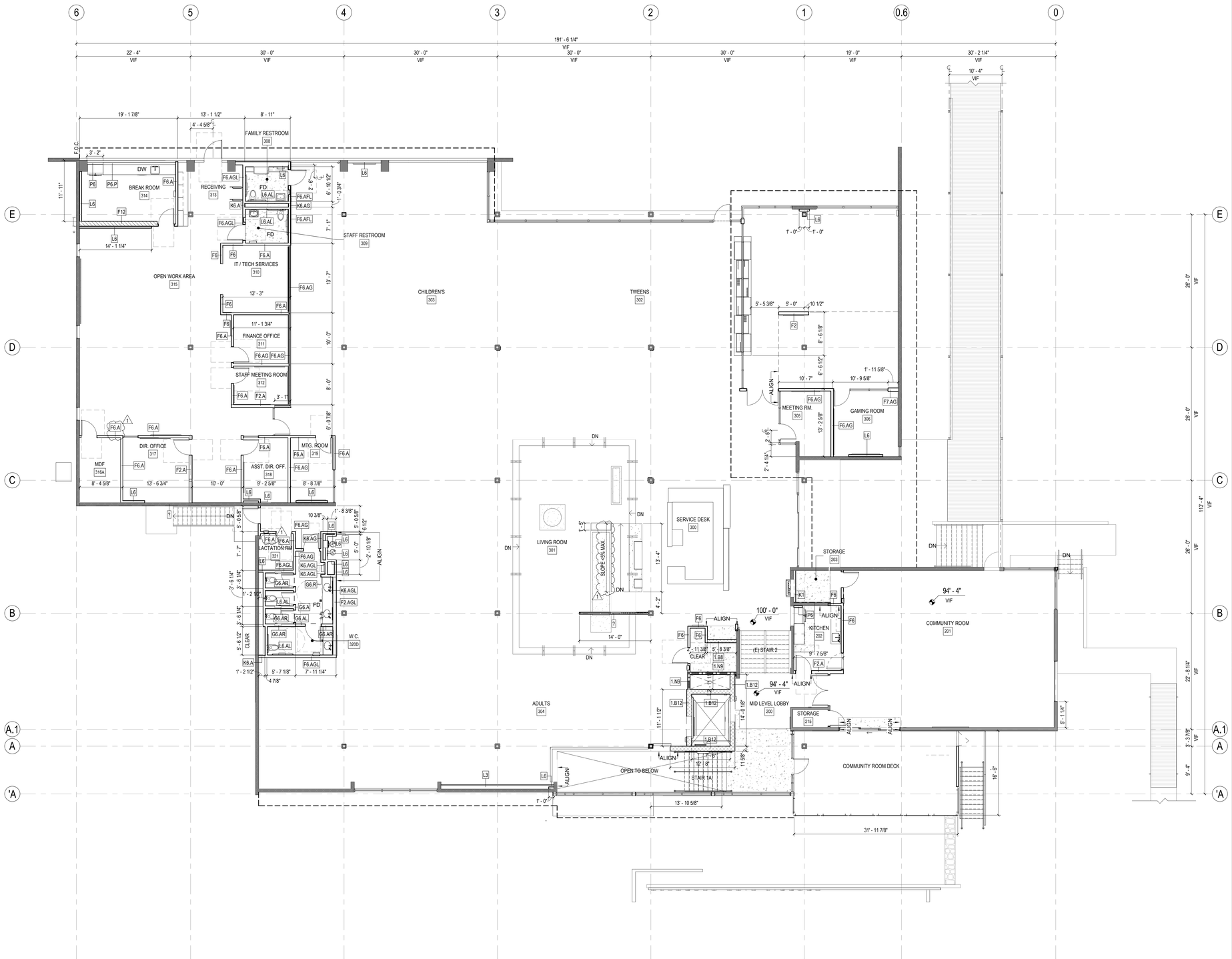
A202



3 ADD ALT. #2 MEETING ROOM ADDITION - DIMENSION PLAN - MAIN LEVEL
1/8" = 1'-0"



2 ADD ALT. #1 NORTH PATIO + SLIDING DOORS - DIMENSION PLAN - MAIN LEVEL
1/8" = 1'-0"



1 DIMENSION PLAN - MAIN LEVEL
1/8" = 1'-0"

DIMENSION PLAN SHEET NOTES

A. ALL DIMENSIONS ARE TO FACE OF STUD OR CENTERLINE AS DESCRIBED ON SHEET A000, U.N.O

LEGEND

- INTERIOR AND EXTERIOR SOFFITS ABOVE
- PARTITION, SEE PARTITION TYPES ON SHEET A800
- CMU WALL, SEE PARTITION TYPES ON SHEET A800
- 1-HR MIN. RATED CMU WALL, SEE PARTITION TYPES ON SHEET A800
- 1-HR RATED STUD WALL, SEE PARTITION TYPES ON SHEET A800
- EXISTING (E) WALL TO REMAIN
- F1.AH — WALL TAG, SEE PARTITION TYPES ON SHEET A800
- CONCRETE SLAB INFILL, SSD

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

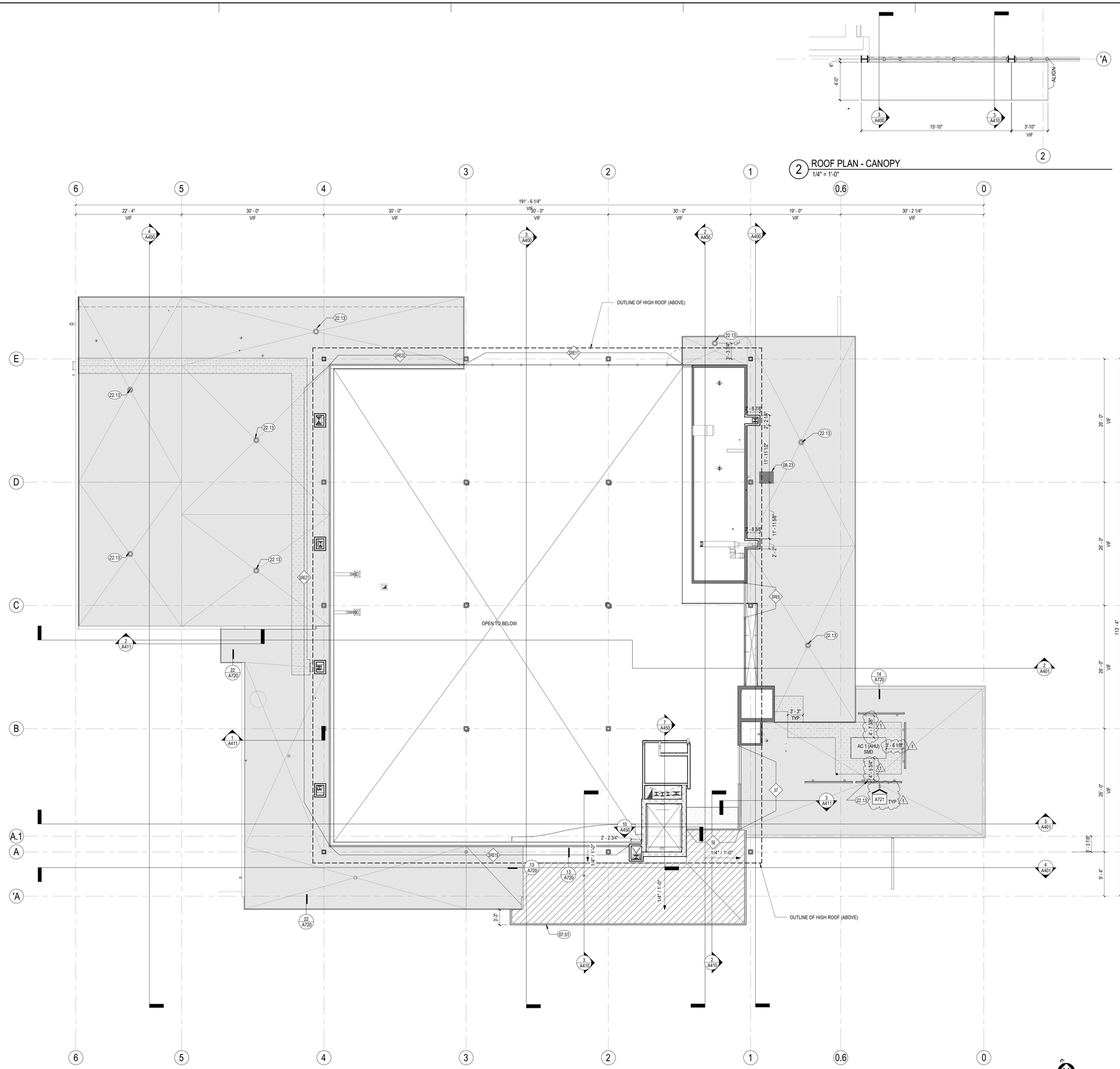
DIMENSION PLAN - MAIN LEVEL

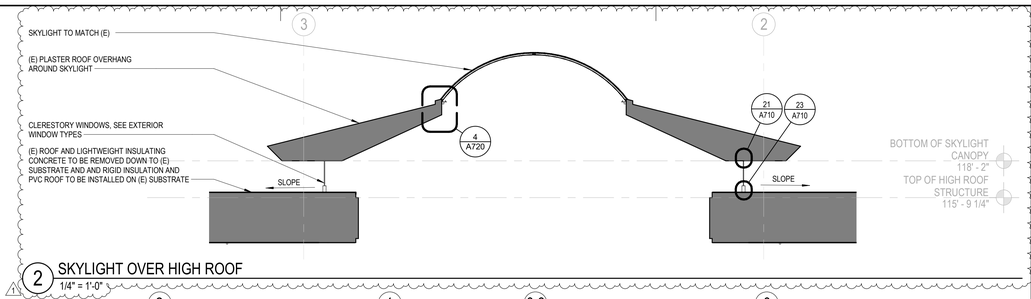
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

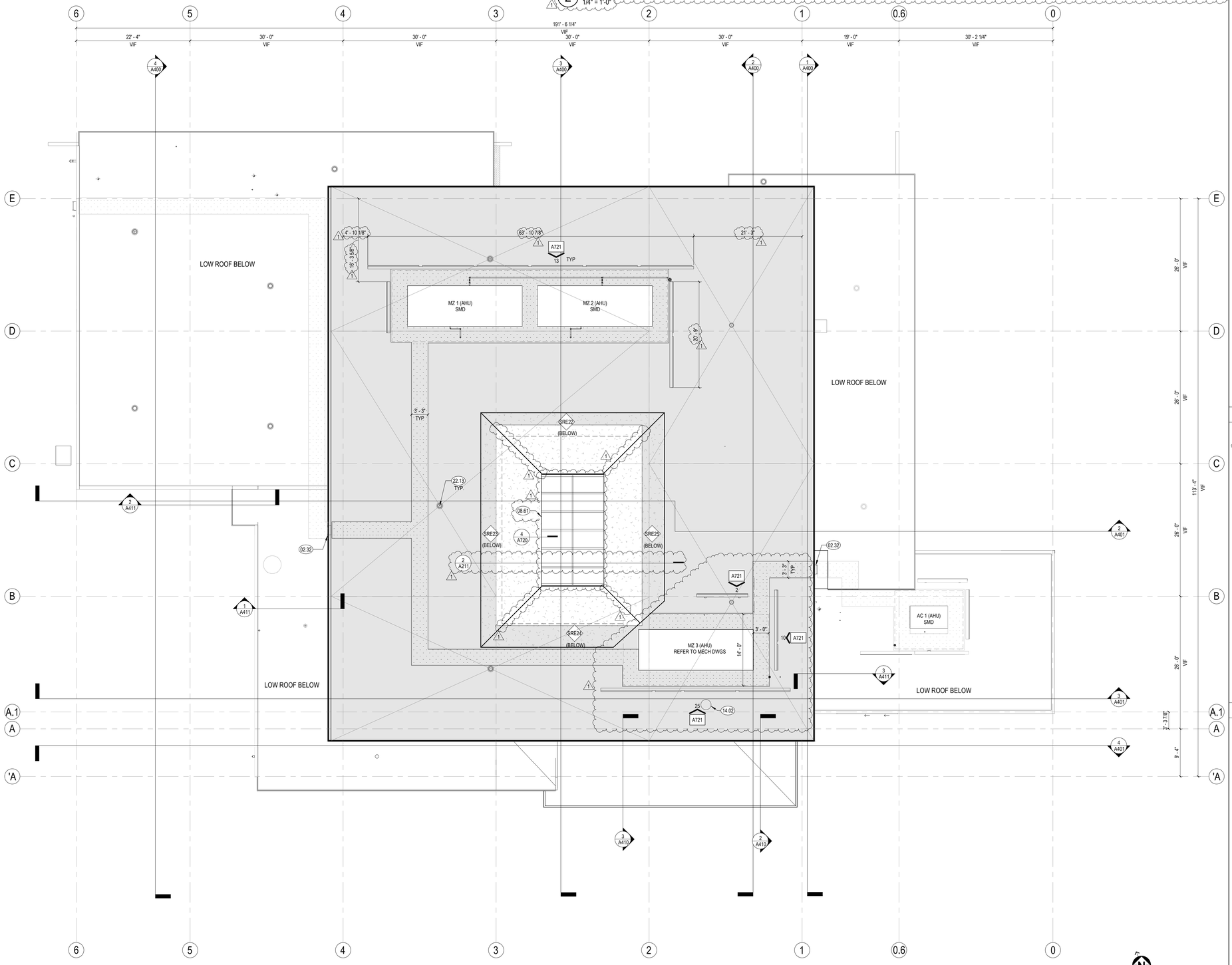
A203

11/7/2024 3:16:43 PM


OUTLINE OF HIGH ROOF (ABOVE)
OPEN TO BELOW
OUTLINE OF HIGH ROOF (ABOVE)
191' - 6 1/4"
22' - 4"
30' - 0"
30' - 0"
30' - 0"
30' - 0"
19' - 0"
30' - 2 1/4"
VIF
AC 1 (AHU) SMD
4' - 7 3/8"
4' - 5 3/4"
3' - 6 1/8"
2' - 8 7/8"
2' - 8 3/8"
11' - 11 1/2"
11' - 11 5/8"
2' - 3 3/4"
2' - 2 1/4"
2' - 2 3/4"
1/4" / 1'-0"
3'-3"
3' - 3 7/8"
9' - 4"
113' - 4"
26' - 0"
3'-10"
15'-10"
4'-0"
ALIGN
3'-3"
TYP.
SRE1
SRE2
SRE3
SRE4
SRE5
SRE6
SRE7
SRE8
SRE9
SRE10
SRE11
SRE12
SRE13
SRE14
SRE15
SRE16
SRE17
SRE18
SRE19
SRE20
SRE21
SRE22
SRE23
SRE24
SRE25
SRE26
SRE27
SRE28
SRE29
SRE30
SRE31
SRE32
SRE33
SRE34
SRE35
SRE36
SRE37
SRE38
SRE39
SRE40



2 SKYLIGHT OVER HIGH ROOF
1/4" = 1'-0"



1 ROOF PLAN - HIGH ROOF
1/8" = 1'-0"

SHEET NOTES

1. PARAPETS AND CURBS SHALL BE A MINIMUM OF 8 INCHES ABOVE THE FINISHED ROOF SURFACE (INCLUDING CRICKETS) TO THE BOTTOM OF THE LOWEST EDGE OF THE PARAPET CAP OR CURB.
2. SKYLIGHTS, HATCHES AND MECHANICAL EQUIPMENT SHALL BE INSTALLED ON CURBS WITH MINIMUM 8 INCH HEIGHT ABOVE THE ADJACENT ROOF SURFACE TO THE LOWEST EDGE OF THE CURB FLASHING FLANGE. FLASHING CAPS SHALL EXTEND DOWN TO COVER THE TOP OF THE ROOFING BY 4 INCHES MINIMUM.
3. ROOF MOUNTED MECHANICAL EQUIPMENT MUST BE CAREFULLY COORDINATED WITH OTHER ROOF ELEMENTS SUCH AS SCREENS AND PARAPETS TO ENSURE ADEQUATE CLEARANCE FOR MAINTENANCE ACCESS AND VENTILATION. AVOID PLACING ROOF PENETRATIONS SUCH AS HATCHES OR UTILITY SERVICE PORTS LESS THAN 24 INCHES FROM PARAPETS OR ROOF EDGES.
4. ROOF PENETRATIONS SHALL BE SPACED A MINIMUM OF 12 INCHES APART CURB-TO-CURB, AND KEPT 24 INCHES AWAY FROM PARAPET WALLS IN ORDER TO PROVIDE CONSTRUCTION AND MAINTENANCE CLEARANCE FOR PENETRATION FLASHINGS.
5. FLASHING FLANGES SHALL BE WELDED TO DUCTWORK AND METAL PENETRATING ELEMENTS WHEREVER POSSIBLE AND SHALL NOT RELY ON "DRAW-BAND" INSTALLATIONS.
6. CRICKETS TO BE BUILT UP WITH TAPERED RIGID INSULATION.
7. ROOF FINISH TO BE PVC MEMBRANE ROOFING
8. PROVIDE 6" MIN. UN-WELDED SEAM AT DRAINAGE SIDE OF WALKWAYS AT SPACING PER MFR.
9. FOR TEMPORARY, PORTABLE, NON-PENETRATING FALL PROTECTION ACCESSORIES, SEE DETAIL

KEYNOTES

02.32 (E) ROOF LADDER TO REMAIN IN PLACE
08.61 SKYLIGHT TO MATCH (E)
14.02 RELIEF VENT
22.13 (E) ROOF DRAIN, VIF

LEGEND

- FOOTPRINT OF BUILDING BELOW
- ROOF ABOVE
- (E) ROOF AND LIGHTWEIGHT INSULATING CONCRETE TO BE REMOVED DOWN TO (E) SUBSTRATE AND AND RIGID INSULATION AND PVC ROOF TO BE INSTALLED ON (E) SUBSTRATE
- PVC ROOF OVER RIGID INSULATION OVER METAL DECK
- SRE# STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
- ROOF WALKWAY
- (E) SLOPED PLASTER ROOF OVERHANG AROUND SKYLIGHT
- (E) SLOPED PLASTER ROOF OVERHANG AROUND SKYLIGHT ABOVE (E) ROOF AND LIGHTWEIGHT INSULATING CONCRETE TO BE REMOVED DOWN TO (E) SUBSTRATE AND AND RIGID INSULATION AND PVC ROOF TO BE INSTALLED ON (E) SUBSTRATE

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

ROOF PLAN - HIGH ROOF

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A211

11/7/2024 5:57:00 PM



1 REFLECTED CEILING PLAN - LOWER LEVEL
1/8" = 1'-0"

11/7/2024 5:57:05 PM

SHEET NOTES

KEYNOTES

05.47	OUTLINE OF CANOPY
06.27	CONCRETE SLAB INFILL. SSD.
10.91	UNDERSIDE OF EXTERIOR STAIR LANDING
26.46	LINEAR UP LIGHT ON GYPSUM BOARD SHELF

LEGEND

- ACT1 — 24"X48" AND 48"X48" TEGULAR ACT CEILING WITH ARMSTRONG SILHOUETTE 1/4" REVEAL GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
- ACT2 — 24"X24" TEGULAR ACT CEILING WITH ARMSTRONG SILHOUETTE 1/4" REVEAL GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
- ACT3 — 24"X24" TEGULAR CEILING WITH 15/16" NARROW GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
- ACT4 — 24"X24" LAY-IN ACT CEILING WITH 15/16" NARROW GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
- GB1 — GYPSUM BOARD CLG, FRAMED SYSTEM, PAINTED
- GB2 — ARMSTRONG ACOUSTIBUILT GYPSUM BOARD CLG (ADD ALTERNATE)
- EXISTING STRUCTURE
- (E) CEMENT PLASTER
- MC1 — LINEAR METAL CEILING (BASE BID)
- MC2 — LINEAR METAL CEILING (ADD ALTERNATE)
- 10'-0" — CEILING HEIGHT A.F.F.
- 10'-0"* — CEILING HEIGHT A.F.F., V.I.F. - CEILING TO ALIGN WITH (E) PLASTER SOFFITS
- MECHANICAL DIFFUSERS, SMD
- ACCESS PANEL. (CONTRACTOR TO VERIFY IN FIELD, BEST LOCATION, SIZE & NEED. COORDINATE W/ OTHER DISCIPLINES WHERE ACCES IS NEEDED.)
- EXIT SIGNAGE; SEE ELECTRICAL DRAWINGS
- S# — WINDOW TAG
- SRE# — STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
- LIGHTING FIXTURES, SED.
- (E) LIGHTING FIXTURES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

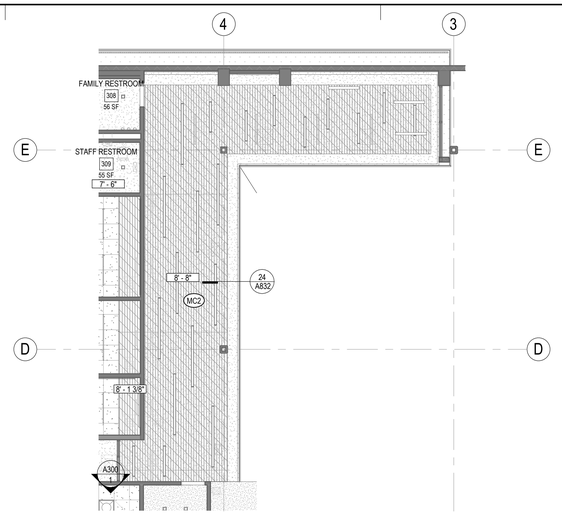
SHEET TITLE:

RCP - LOWER LEVEL

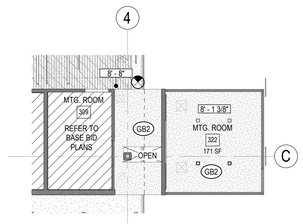
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

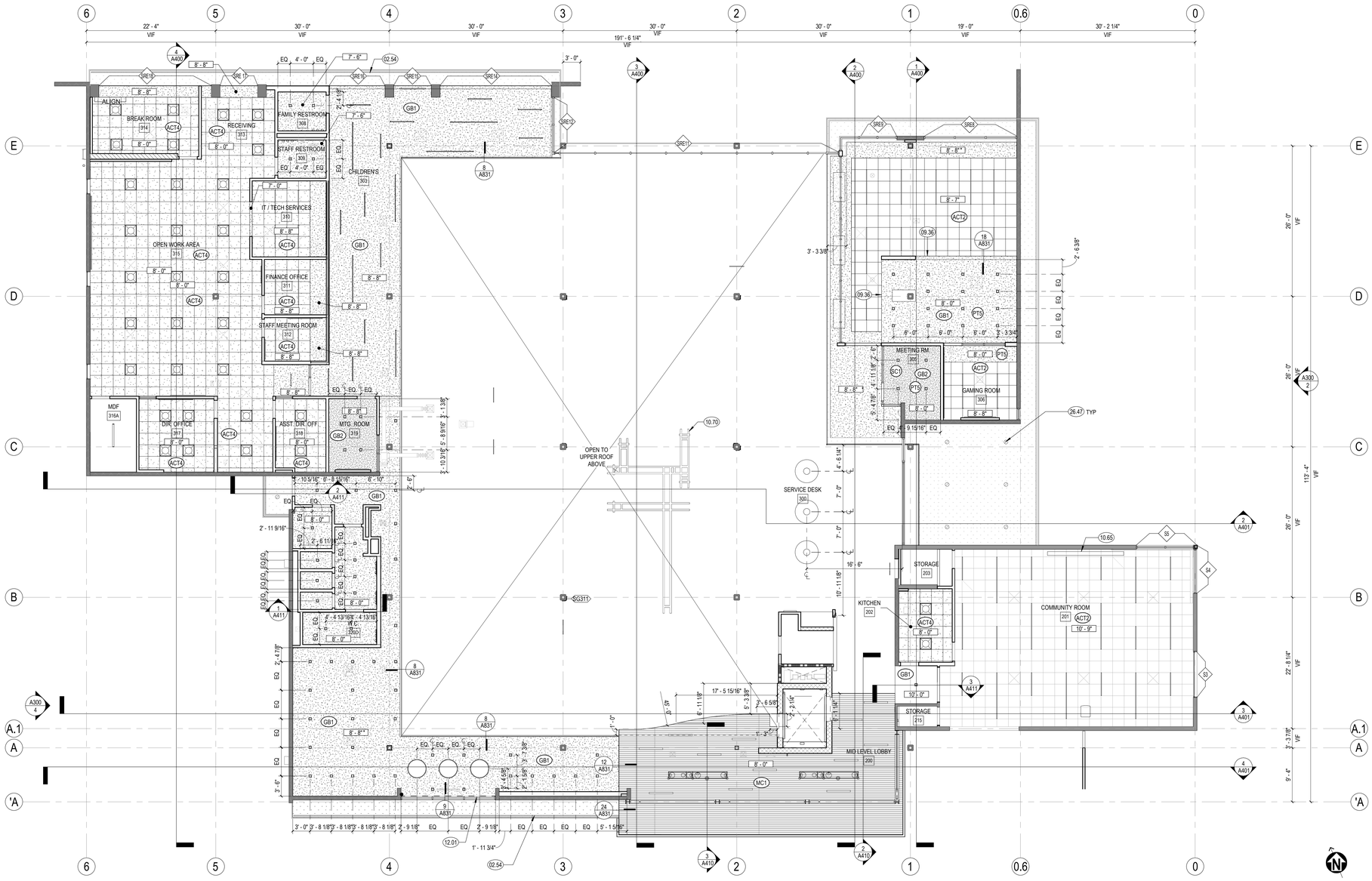
A220



2 ADD ALT #3 CHILDREN'S AREA CEILING - RCP
1/8" = 1'-0"



3 ADD ALT #2 MEETING ROOM ADDITION - RCP
1/8" = 1'-0"



1 REFLECTED CEILING PLAN - MAIN LEVEL LOWER CEILING
1/8" = 1'-0"

SHEET NOTES

KEYNOTES

02.54	(E) 2" SOFFIT VENT
09.36	ACCENT PAINT SIDE OF SOFFIT
10.65	CEILING MOUNTED RETRACTABLE SCREEN, SEE AV DRAWINGS
10.70	DIAPER CHANGING STATION
11.71	PROJECTOR, OFCI. SEE AV DWGS
11.72	RECESSED CEILING SPEAKER, TYP. SEE AV DWGS
12.01	MANUAL WINDOW SHADE. SEE FINISH LEGEND FOR MATERIAL
26.47	(E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL

LEGEND

ACT1	24"X48" AND 48"X48" TEGULAR ACT CEILING WITH ARMSTRONG SILHOUETTE 1/4" REVEAL GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
ACT2	24"X24" TEGULAR ACT CEILING WITH ARMSTRONG SILHOUETTE 1/4" REVEAL GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
ACT3	24"X24" TEGULAR CEILING WITH 15/16" NARROW GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
ACT4	24"X24" LAY-IN ACT CEILING WITH 15/16" NARROW GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
GB1	GYPSUM BOARD CLG, FRAMED SYSTEM, PAINTED
GB2	ARMSTRONG ACOUSTIBUILT GYPSUM BOARD CLG (ADD ALTERNATE)
	EXISTING STRUCTURE
	(E) CEMENT PLASTER
MC1	LINEAR METAL CEILING (BASE BID)
MC2	LINEAR METAL CEILING (ADD ALTERNATE)
10'-0"	CEILING HEIGHT A.F.F.
10'-0"*	CEILING HEIGHT A.F.F., V.I.F. - CEILING TO ALIGN WITH (E) PLASTER SOFFITS
	MECHANICAL DIFFUSERS, SMD
	ACCESS PANEL. (CONTRACTOR TO VERIFY IN FIELD, BEST LOCATION, SIZE & NEED. COORDINATE W/ OTHER DISCIPLINES WHERE ACCES IS NEEDED.)
	EXIT SIGNAGE; SEE ELECTRICAL DRAWINGS
S#	WINDOW TAG
SRE#	STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
	LIGHTING FIXTURES, SED.
	(E) LIGHTING FIXTURES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024
SHEET TITLE:	

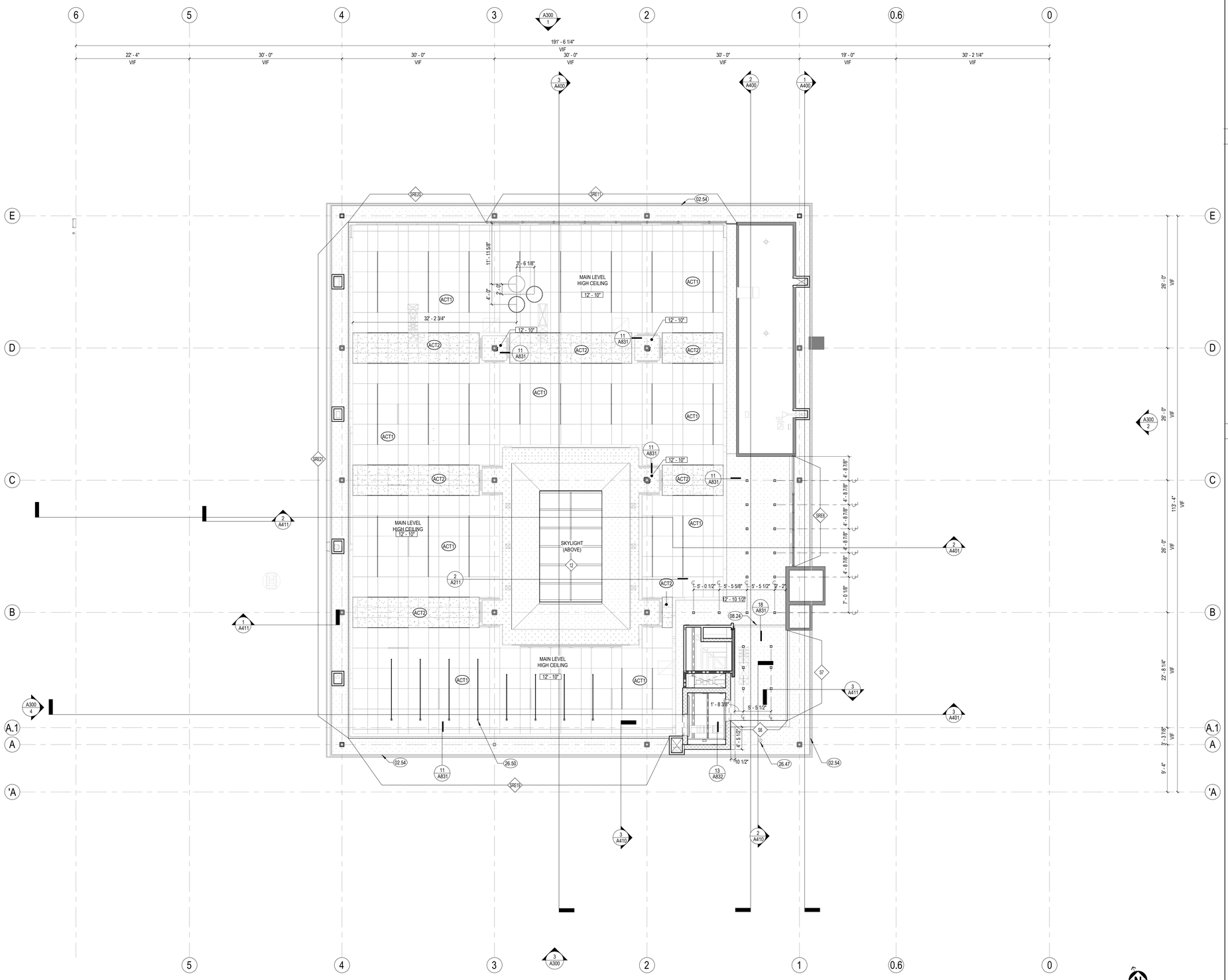
RCP - MAIN LEVEL LOWER CEILING

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A221

11/7/2024 3:17:11 PM



1 REFLECTED CEILING PLAN - MAIN LEVEL UPPER CEILING
1/8" = 1'-0"

11/7/2024 3:17:17 PM

SHEET NOTES

KEYNOTES

02.54	(E) 2" SOFFIT VENT
08.24	(E) MOTORIZED COILING GRILLE TO REMAIN
26.47	(E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL
26.50	SUSPENDED LINEAR LIGHT FIXTURES TO BE CENTERED BETWEEN SHELVING UNITS, SEE 1/A253

LEGEND

ACT1	24"X48" AND 48"X48" TEGULAR ACT CEILING WITH ARMSTRONG SILHOUETTE 1/4" REVEAL GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
ACT2	24"X24" TEGULAR ACT CEILING WITH ARMSTRONG SILHOUETTE 1/4" REVEAL GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
ACT3	24"X24" TEGULAR CEILING WITH 15/16" NARROW GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
ACT4	24"X24" LAY-IN ACT CEILING WITH 15/16" NARROW GRID, REFER TO SPECS FOR ADDITIONAL INFORMATION
GB1	GYPSUM BOARD CLG, FRAMED SYSTEM, PAINTED
GB2	ARMSTRONG ACOUSTIBUILT GYPSUM BOARD CLG (ADD ALTERNATE)
	EXISTING STRUCTURE
	(E) CEMENT PLASTER
MC1	LINEAR METAL CEILING (BASE BID)
MC2	LINEAR METAL CEILING (ADD ALTERNATE)
10'-0"	CEILING HEIGHT A.F.F.
10'-0"*	CEILING HEIGHT A.F.F., V.I.F. - CEILING TO ALIGN WITH (E) PLASTER SOFFITS
	MECHANICAL DIFFUSERS, SMD
	ACCESS PANEL. (CONTRACTOR TO VERIFY IN FIELD, BEST LOCATION, SIZE & NEED. COORDINATE W/ OTHER DISCIPLINES WHERE ACCES IS NEEDED.)
	EXIT SIGNAGE; SEE ELECTRICAL DRAWINGS
S#	WINDOW TAG
SRE#	STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
	LIGHTING FIXTURES, SED.
	(E) LIGHTING FIXTURES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

RCP - MAIN LEVEL UPPER CEILING

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A222



FINISH PLAN SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. FOR VERTICAL FINISHES SEE ELEVATIONS
C. FOR INTERIOR DOOR FRONT TYPE SEE A600
D. FURNITURE SHOWN FOR REFERENCE ONLY
E. ALL WALL BASE TO BE RUBBER BASE, WB, AS NOTES IN FINISH LEGEND, U.N.O.
F. ALL GYPSUM BOARD WALLS TO BE PAINTED P1 U.N.O.
G. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED U.N.O.
H. FOR AV EQUIPMENT LOCATIONS SEE RCP'S AND EQUIPMENT PLANS
I. SEE SIGNAGE PLANS & ELEVATIONS ON SHEETS A254, A255, & A854 FOR SIGNAGE PAINT LOCATIONS AND EXTENT
J. FLOOR FINISH TRANSITIONS BETWEEN MATERIAL TYPES OR PATTERN CHANGES ARE INDICATED WITH A LINE IN DOORWAYS, OPENING, OR OTHER LOCATIONS
K. PROVIDE TRANSITION STRIPS AT ALL LOCATIONS WHERE DIFFERENT MATERIALS ABUT U.N.O., SEE INTERIOR TRANSITION DETAILS ON SHEET A810
L. FLOOR MATERIAL TO BE INSTALLED UNDER CASEWORK U.N.O.
M. ALL CARPET TO MEET COMPLIANCE WITH CBC 804.4

FINISH PLAN KEYNOTES

06.71 PEGBOARD
09.77 FABRIC WRAPPED ACOUSTIC PANEL, SEE ELEVATIONS FOR EXTENT AND FINISH
09.78 TACKABLE ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
10.58 CORNER GUARD
12.48 ENTRANCE FLOOR GRILLE, SEE EXTERIOR DETAILS ON SHEET A700 AND SCD.

FINISH PLAN LEGEND

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT# — WALL FINISH CALLOUT, SEE A240 FOR PAINT COLOR
INDICATES START OF FLOOR PATTERN
INDICATES TRANSITION OF MATERIAL
FLOOR INSTALLATION DIRECTION
PATTERN INDICATES FLOORING TYPE, SEE FINISH LEGEND ON SHEET A240

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
.	06/24/2024	BUILDING PERMIT SUBMITTAL
.		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

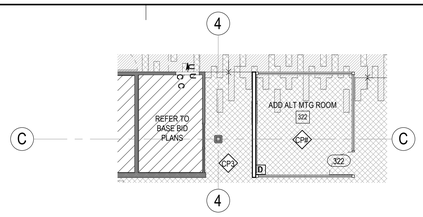
FINISH PLAN - LOWER LEVEL

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A230

11/7/2024 3:17:21 PM



2 ADD ALT. #2 MEETING ROOM ADDITION - FLOOR PLAN - MAIN LEVEL
1/8" = 1'-0"



1 FINISH PLAN - MAIN LEVEL
1/8" = 1'-0"

FINISH PLAN SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. FOR VERTICAL FINISHES SEE ELEVATIONS
C. FOR INTERIOR DOOR FRONT TYPE SEE A600
D. FURNITURE SHOWN FOR REFERENCE ONLY
E. ALL WALL BASE TO BE RUBBER BASE, VB. AS NOTES IN FINISH LEGEND, U.N.O.
F. ALL GYPSUM BOARD WALLS TO BE PAINTED P1 U.N.O.
G. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED U.N.O.
H. FOR AV EQUIPMENT LOCATIONS SEE RCP'S AND EQUIPMENT PLANS
I. SEE SIGNAGE PLANS & ELEVATIONS ON SHEETS A254, A255, & A854 FOR SIGNAGE PAINT LOCATIONS AND EXTENT
J. FLOOR FINISH TRANSITIONS BETWEEN MATERIAL TYPES OR PATTERN CHANGES ARE INDICATED WITH A LINE IN DOORWAYS, OPENING, OR OTHER LOCATIONS
K. PROVIDE TRANSITION STRIPS AT ALL LOCATIONS WHERE DIFFERENT MATERIALS ABUT U.N.O., SEE INTERIOR TRANSITION DETAILS ON SHEET A810
L. FLOOR MATERIAL TO BE INSTALLED UNDER CASEWORK U.N.O.
M. ALL CARPET TO MEET COMPLIANCE WITH CBC 804.4

FINISH PLAN KEYNOTES

01 DIVISION 01 - DEMOLITION
09.52 EXISTING TILE TO REMAIN
09.63 SEE A252 & A253 SIGNAGE PLANS FOR ADDITIONAL INFORMATION
09.77 FABRIC WRAPPED ACOUSTIC PANEL, SEE ELEVATIONS FOR EXTENT AND FINISH
10.58 CORNER GUARD
10.82 FIRE EXTINGUISHER CABINET, SURFACE MOUNTED.
12.21 GLASS MARKERBOARD
12.48 ENTRANCE FLOOR GRILLE, SEE EXTERIOR DETAILS ON SHEET A700 AND SCD.

FINISH PLAN LEGEND

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT# WALL FINISH CALLOUT, SEE A240 FOR PAINT COLOR
INDICATES START OF FLOOR PATTERN
INDICATES TRANSITION OF MATERIAL
FLOOR INSTALLATION DIRECTION
PATTERN INDICATES FLOORING TYPE, SEE FINISH LEGEND ON SHEET A240

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

FINISH PLAN - MAIN LEVEL

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A231

11/7/2024 3:17:28 PM

FLOOR FINISHES

CARPET

CP1
CARPET TILE
MFR: MILLIKEN
PATTERN: PLATO
COLOR: CELESTITE
SIZE: 9x36
CUSTOM: DR: 01390881
BACKING: WELLBAC CUSHION

CP2
CARPET TILE
MFR: MILLIKEN
PATTERN: GRAIN BIAS
COLOR: RAW EDGE
SIZE: 9x36
BACKING: WELLBAC CUSHION

CP3
CARPET TILE
MFR: MILLIKEN
PATTERN: PLATO
COLOR: BRONZE
SIZE: 9x36
BACKING: WELLBAC CUSHION

CP4
CARPET TILE
MFR: INTERFACE
PATTERN: SOCIAL FABRIC
COLOR: SUNSET
SIZE: 9x36
BACKING: CQUEST GB

CP5
CARPET TILE
MFR: INTERFACE
PATTERN: AQUATINT
COLOR: CARBON
SIZE: 9x36
BACKING: CQUEST GB

CP6
WALK OFF CARPET TILE
MFR: MILLIKEN
PATTERN: CUT / STRUM
COLOR: DARK GREY
BACKING: WELLBAC CUSHION

CP7
WALK OFF CARPET TILE
MFR: MILLIKEN
PATTERN: CUTX / FIZZ
COLOR: DARK GREEN
BACKING: WELLBAC CUSHION

TILE

TF1
PORCELAIN FLOOR TILE
MFR: DALTILE
TYPE: HAUTE MONDE
COLOR: GLITTERATI GRANITE
GROUT: TBD
SIZE: 12X24

RESILIENT

RF1
RESILIENT FLOOR
MFR: TARKETT
TYPE: LINOLEUM TRENTINO XF²
SIZE: 2.5MM THICK
COLOR: GREY PEPPER

RF2
RESILIENT FLOOR
MFR: MARMOLEUM
TYPE: FRESCO
SIZE: ROLLED GOODS
COLOR: DOVE BLUE

POLISHED CONCRETE

PC1
POLISHED CONCRETE
MFR: N/A
TYPE: N/A
COLOR: N/A
NOTE: N/A

EPOXY TERRAZZO

ET1
EPOXY TERRAZZO
MFR: EV MATERIALS CORP.
TYPE: N/A
COLOR: TBD
NOTE: CONFIRM COLOR WITH ARCHITECT BEFORE INTALLING

WALL FINISHES

PAINT

PT1
GENERAL WALL PAINT
MFR: DUNN EDWARDS
PAINT TYPE: SEE SPECIFICATIONS
COLOR: WHITE FEVER
FINISH: SEE SPECS

PT2
ACCENT PAINT
MFR: DUNN EDWARDS
COLOR: DET467 - HARRISON RUST
FINISH: SEE SPECIFICATIONS

PT3
ACCENT PAINT
MFR: DUNN EDWARDS
COLOR: DET578 - YANKEE DOODLE
FINISH: SEE SPECIFICATIONS

PT4
ACCENT PAINT
MFR: DUNN EDWARDS
COLOR: DE6385 - BLACK BEAN
FINISH: SEE SPECIFICATIONS

PT5
ACCENT PAINT
MFR: DUNN EDWARDS
COLOR: DE5509 - ORGANIC MATTER
FINISH: SEE SPECIFICATIONS

PT6
ACCENT PAINT
MFR: DUNN EDWARDS
COLOR: DE5933 - WINTER DUSK
FINISH: SEE SPECIFICATIONS

PT7
ACCENT PAINT
MFR: DUNN EDWARDS
COLOR: DET486 - WILDFLOWER HONEY
FINISH: SEE SPECIFICATIONS
NOTE: AT SIGNAGE LOCATIONS ONLY

TILE

TW1
WALL TILE
MFR: FIRECLAY
TYPE: CERAMIC
COLOR: BONE BLACK SATIN (V2)
FINISH: SATIN
SIZE: 2X8
GROUT: TBD
TRIM: INCLUDE TRIM PIECES

TW2
WALL TILE
MFR: FIRECLAY
TYPE: BRICK
COLOR: COLUMBIA PLATEAU
FINISH: GLOSS
SIZE: 2.5X8
GROUT: CUSTOM BUILDING PRODUCTS - BROWN VELVET
TRIM: INCLUDE TRIM PIECES

TW3
WALL TILE
MFR: DALTILE
TYPE: COLOR WHEEL LINEAR
COLOR: BISCUIT
FINISH: GLOSS
SIZE: 2X8
GROUT: LATICRETE - STERLING SILVER
TRIM: INCLUDE TRIM PIECES

TW4
WALL TILE
MFR: DALTILE
TYPE: COLOR WHEEL LINEAR
COLOR: BISCUIT
FINISH: MATTE
SIZE: 2X8
GROUT: LATICRETE - STERLING SILVER
TRIM: SCHLUTER JOLLY, COLOR TBD

TW5
WALL TILE COVE BASE
MFR: DALTILE
COLOR: HAUT MONDE
SIZE: 6X12
GROUT: LATICRETE - RAVEN

TW6
WALL TILE COVE BASE
MFR: DALTILE
TYPE: FLAT TOP COVE BASE
COLOR: BISCUIT
FINISH: GLOSS
SIZE: 4X12
GROUT: LATICRETE - STERLING SILVER

TW7
WALL TILE COVE BASE
MFR: DALTILE
TYPE: BULLNOSED COVE BASE
COLOR: BISCUIT
FINISH: GLOSS
SIZE: 4X12
GROUT: LATICRETE - STERLING SILVER

WALL BASE

WB1
RUBBER WALL BASE
MFR: BURKE
TYPE: RUBBER BASE WITH FOOT
SIZE: 4"
COLOR: ???

WALL PROTECTION

WP1
ACROVYN PANEL
MFR: ACROVYN
TYPE: ???
HEIGHT: 5'-6" A.F.F.
COLOR: ???

CASEWORK FINISHES

PLASTIC LAMINATE

PL1
PLASTIC LAMINATE
MFR: NEVAMAR
COLOR: MIESIAN
FINISH: WOOD ESSENCE
NOTE: AT SERVICE DESK ONLY

PL2
PLASTIC LAMINATE
MFR: NEVAMAR
COLOR: MIESIAN
FINISH: TEXTURED SUEDE

PL3
PLASTIC LAMINATE
MFR: WILSONART
COLOR: MORELIA MANGO
FINISH: TIMBERGRAIN
NOTE: AT SERVICE DESK ONLY

PL4
PLASTIC LAMINATE
MFR: NEVAMAR
COLOR: AQUA MINI RAFFIA
FINISH: TEXTURED SUEDE

PL5
PLASTIC LAMINATE
MFR: LAMINART
COLOR: CLASSIC BRUSHED CHAMPAGNE
FINISH: BRUSHED

PL6
PLASTIC LAMINATE
MFR: NEVAMAR
COLOR: GUNMETAL
FINISH: TEXTURED SUEDE

SOLID SURFACE

SS1
QUARTZ SOLID SURFACE
MFR: WILSONART
COLOR: GRAPHITE
NOTE: SEE DETAILS FOR THICKNESS

SS2
SOLID POLYMER SOLID SURFACE
MFR: CORIAN
COLOR: BONE
NOTE: SEE DETAILS FOR THICKNESS

SS3
TRESPA
MFR: TRESPA
TYPE: TOPLAB
COLOR: SLATE GREY

SS4
QUARTZ SOLID SURFACE
MFR: WILSONART
COLOR: BODEGA
NOTE: SEE DETAILS FOR THICKNESS

WOOD FINISHES

WD1
WOOD VENEER TEENS WALL
MFR: VENEER-ART
COLOR: 974-WG BROWN ANNIGRE
FINISH: WEATHERED-GRAIN
NOTE: QUARTER CUT/SLIP MATCHED

METAL FINISHES

MTL
METAL FURNITURE LEG
MFR: ???
COLOR: ???
FINISH: ???

SPECIALTY FINISHES

FABRIC

FA1
MFR: DESIGNTEX
NAME: GAMUT
FINISH: STONE

FA2
MFR: DESIGNTEX
NAME: GAMUT
FINISH: OLIVE

FA3
MFR: DESIGNTEX
NAME: GAMUT
FINISH: NUTMEG

FA4
MFR: DESIGNTEX
NAME: GAMUT
FINISH: CADET

FA5
MFR: DESIGNTEX
NAME: GAMUT
FINISH: PUMICE

FA6
MFR: DESIGNTEX
NAME: GAMUT
FINISH: COBBLESTONE

FA7
MFR: DESIGNTEX
NAME: GAMUT
FINISH: BUTTERSCOTCH

CEILING

CT1
WOOD CEILING
MFR: RULON
NAME: LINEAR OPEN
COLOR: ENGLISH WALNUT

RESIN / GLASS

RP1
ACRYLIC RESIN
MFR: 3 FORM
NAME: ???
FINISH: ???

RP2
ACRYLIC RESIN
MFR: 3 FORM
NAME: VARIA
COLOR: TBD
FINISH: SANDSTONE
NOTE: SIGNAGE ONLY

RP3
ACRYLIC RESIN
MFR: 3 FORM
NAME: VARIA
COLOR: VAPOR
FINISH: SANDSTONE
NOTE: AT LIBRARY OF THINGS

GL1
GLASS PANEL
MFR: 3 FORM
NAME: LID-1069447
SIZE: 1/2"
COLOR: CUSTOM
FINISH: NONE ANNEALED 4MM LOW IRON LITE
NOTE: SO-582602S2.2

ACOUSTIC FELT

AP1
RIGID ACOUSTIC FELT
MFR: SOELBERG
NAME: MUTO DIVIDER ACOUSTIC PANEL
THICKNESS: 1/2"
PATTERN: CUSTOM DESIGN
COLOR: LAMBS EAR

OTHER

ROLLER SHADE FABRIC
MFR: MECHO SHADE
NAME: TBD
SIZE: TBD
COLOR: TBD
FINISH: TBD

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024
SHEET TITLE:

FINISH LEGEND

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A240

11/7/2024 3:17:30 PM

SIGNAGE PLAN SHEET NOTES

1. CONTRACTOR TO CONFIRM ALL ROOM NAMES AND NUMBERS WITH OWNER AND ARCHITECT PRIOR TO FABRICTAION

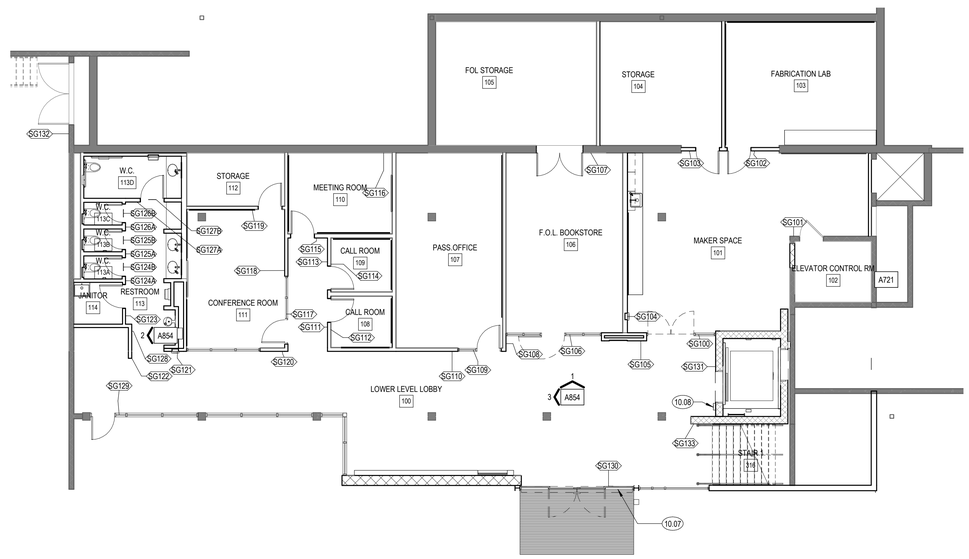
SIGNAGE PLAN KEYNOTES

10.07 INTERNATIONAL SYMBOL OF ACCESSIBILITY AND NO SMOKING SYMBOL AT ACCESSIBLE BUILDING ENTRY, SEE 1/A852

10.08 HOISTWAY AND ELEVATOR ENTRANCE, SEE 12B/A455

SIGNAGE LEGEND

MARK	SIGN TYPE	TACTILE & BRAILLE	COMMENTS	DETAIL
SG100	ID.01	MAKER SPACE		11/A852
SG101	ID.01	ELEVATOR CONTROL ROOM		11/A852
SG102	ID.01	FAB LAB		11/A852
SG103	ID.01	STAFF ONLY		11/A852
SG104	REG.03	N/A		4/A852
SG105	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "FAB LAB & MAKER SPACE	3/A853
SG106	ID.01	BOOKSTORE		11/A852
SG107	ID.01	STAFF ONLY		11/A852
SG108	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "BOOKSTORE"	3/A853
SG109	ID.01	PASSPORT SERVICES		11/A852
SG110	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "PASSPORTS"	3/A853
SG111	ID.01	STUDY ROOM 1		11/A852
SG112	ASSISITIVE LISTENING	N/A		8/A852
SG113	ID.01	STUDY ROOM 2		11/A852
SG114	ASSISITIVE LISTENING	N/A		8/A852
SG115	ID.01	MEETING ROOM 3		11/A852
SG116	ASSISITIVE LISTENING	N/A		8/A852
SG117	ID.01	CONFERENCE ROOM		11/A852
SG118	ASSISITIVE LISTENING	N/A		8/A852
SG119	ID.01	STAFF ONLY		11/A852
SG120	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "MEETING ROOMS"	3/A853
SG121	N/A	N/A		4/A852
SG123	ID.01	CUSTODIAN		11/A852
SG124A	REG.01	RESTROOM		7A/B52
SG124B	REG.01	N/A		7B/852
SG125A	REG.01	RESTROOM		7A/852
SG125B	REG.01	N/A		7B/852
SG126A	REG.01	RESTROOM		7A/852
SG126B	REG.01	N/A		7B/852
SG127A	REG.01	RESTROOM		7A/852
SG127B	REG.01	N/A		7B/852
SG128	REG.01	RESTROOMS		2/A852
SG129	REG.02 - E1	EXIT		19/A852
SG130	REG.02 - E1	EXIT		19/A852
SG131	ELEVATOR	ELEVATOR		X/XXX
SG132	ID.01	ELECTRICAL ROOM		11/A852
SG133	S1	STAIR 1		20/A852



1 SIGNAGE PLAN - LOWER LEVEL
1/8" = 1'-0"

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

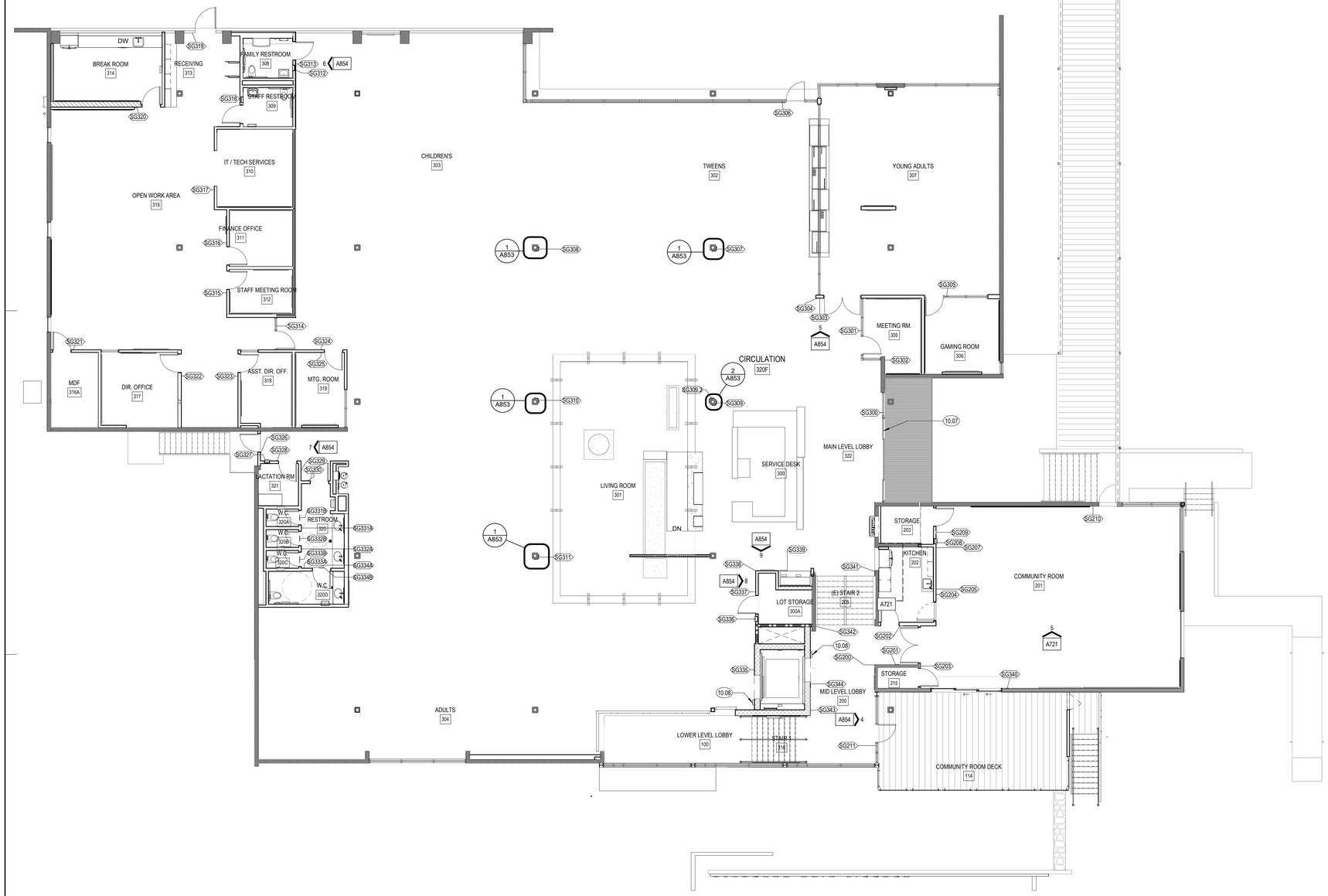
SIGNAGE PLAN - LOWER LEVEL

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A254

11/7/2024 3:17:34 PM



1 SIGNAGE PLAN - MAIN LEVEL
1/8" = 1'-0"

SIGNAGE PLAN SHEET NOTES

1. SEE A501, A852 AND A853 FOR SIGNAGE DETAILS
2. SEE A221 - RCP FOR ADDITIONAL SIGNAGE INFORMATION

SIGNAGE PLAN KEYNOTES

10.07 INTERNATIONAL SYMBOL OF ACCESSIBILITY AND NO SMOKING SYMBOL AT ACCESSIBLE BUILDING ENTRY, SEE 1/A852
10.08 HOISTWAY AND ELEVATOR ENTRANCE, SEE 12B/A455

SIGNAGE LEGEND

Mark	SIGN TYPE	TACTILE & BRAILE	COMMENTS	DETAIL
SG200	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "COMMUNITY ROOM"	3/A853
SG201	ID.01	COMMUNITY ROOM		11/A852
SG202	ID.01	KITCHEN		11/A852
SG203	ID.01	STORAGE		11/A852
SG204	ID.01	KITCHEN		11/A852
SG205	ASSISTIVE LISTENING	N/A		8/A852
SG207	REG.05	N/A		3/A852
SG208	REG.03	FIRE EXTINGUISHER		4/A852
SG209	ID.01	STAFF ONLY		11/A852
SG210	REG.02	COMMUNITY ROOM		
SG211	ID.01	COMMUNITY ROOM DECK		11/A852
SG340	ID.01	COMMUNITY ROOM DECK		11/A852
SG342	S1	STAIR 2		20/A852
SG343	S1	STAIR 1		20/A852
SG344	ELEVATOR	ELEVATOR		X/XXX

MARK	SIGN TYPE	TACTILE & BRAILE	COMMENTS	DETAIL
SG300	REG.02 - E1	EXIT		19/A852
SG301	ID.01	MEETING ROOM 1		11/A852
SG302	ASSISTIVE LISTENING	N/A		8/A852
SG303	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "TEEN'S"	3/A853
SG304	ID.01	TEENS		11/A852
SG305	ID.01	GAMING ROOM		11/A852
SG306	REG.02 - E1	EXIT		19/A852
SG307	ID.04	N/A	SIGN TO READ AS "TWEENS"	5/A853
SG308	ID.04	N/A	SIGN TO READ AS "CHILDRENS"	5/A853
SG309	ID.04	N/A	SIGN TO READ AS "INFORMATION"	5/A853
SG309.2	ID.04	N/A	SIGN TO READ AS "INFORMATION"	5/A853
SG310	ID.03	N/A	SIGN TO READ "COMPUTERS" ON ONE SIDE AND "COPY/PRINT" ON THE OTHER	4/A853
SG311	ID.03	N/A	SIGN TO READ AS "INFORMATION"	4/A853
SG312	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "FAMILY RESTROOM"	3/A853
SG313	ID.02	FAMILY RESTROOM		7A/852
SG314	ID.01	STAFF ONLY		11/A852
SG315	ID.01	MEETING ROOM		11/A852
SG316	ID.01	OFFICE		11/A852
SG317	ID.01	OFFICE		11/A852
SG318	REG.01	RESTROOM		7A/852
SG319	REG.02 - E1	EXIT		19/A852
SG320	ID.01	LOUNGE		11/A852
SG321	ID.01	NETWORK		11/A852
SG322	ID.01	DISTRICT DIRECTOR		11/A852
SG323	ID.01	ASSISTANT DIRECTOR		11/A852
SG324	ID.01	MEETING ROOM		11/A852
SG325	ASSISTIVE LISTENING	N/A		8/A852
SG326	REG.02 - E3	EXIT		19/A852
SG327	REG.03	FIRE EXTINGUISHER		4/A852
SG328	ID.01	LACTATION ROOM		11/A852
SG329	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "RESTROOMS"	3/A853
SG330	REG.01	RESTROOMS		7A/852
SG331A	REG.01	RESTROOM		7A/852
SG331B	REG.01	N/A		7B/852
SG332A	REG.01	RESTROOM		7A/852
SG332B	REG.01	N/A		7B/852
SG333A	REG.01	RESTROOM		7A/852
SG333B	REG.01	N/A		7B/852
SG334A	REG.01	RESTROOM		7A/852
SG334B	REG.01	N/A		7B/852
SG335	ELEVATOR	ELEVATOR		X/XXX
SG336	REG.03	FIRE EXTINGUISHER		4/A852
SG337	ID.01	STAFF ONLY		11/A852
SG338	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "BOOKDROP"	3/A853
SG339	ID.02	N/A	VINYL LETTER SIGNAGE TO READ "BOOKDROP" &" LAPTOPS	3/A853
SG341	S1	STAIR 2		20/A852

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

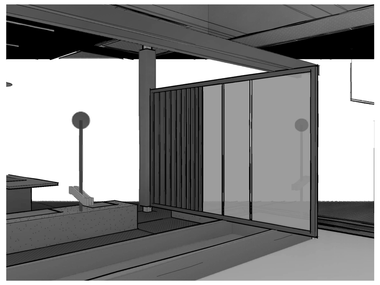
SIGNAGE PLAN - MAIN LEVEL

SCALE: 1/8" = 1'-0"

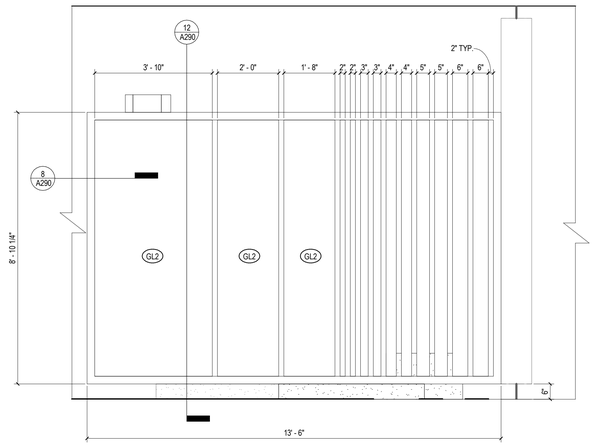
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A255

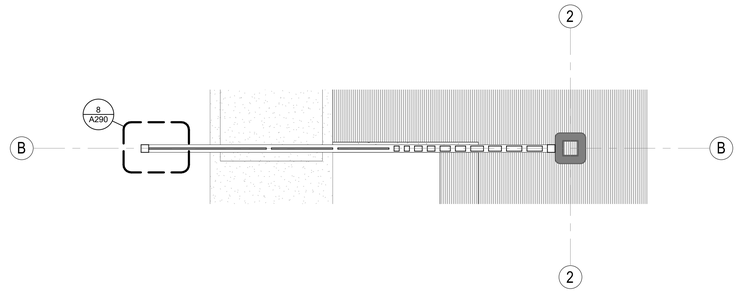
11/7/2024 3:17:42 PM

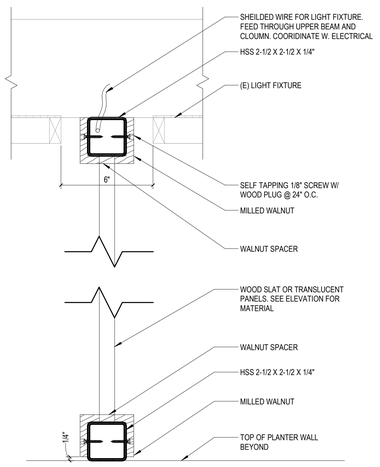


10 LIVING ROOM ELEMENT (FOR REFERENCE ONLY)



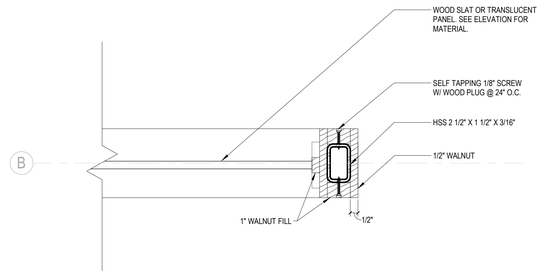
6 LIVING ROOM ELEMENT - ELEVATION - N
1/2" = 1'-0"





12 LIVING ROOM ELEMENT - SECTION
3" = 1'-0"

7 LIVING ROOM ELEMENT - ENLARGED PLAN
1/2" = 1'-0"



8 LIVING ROOM ELEMENT - EDGE DETAIL
3" = 1'-0"

11/7/2024 3:17:49 PM

SHEET NOTES

KEYNOTES

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

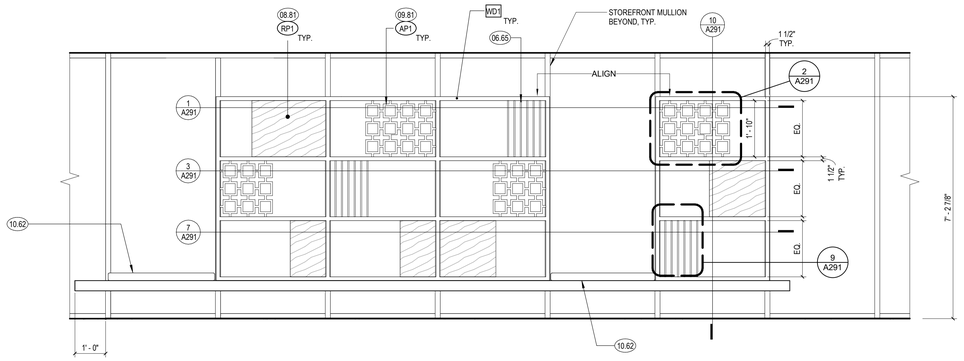
SHEET TITLE:

ENLARGED PLANS & ELEVATIONS

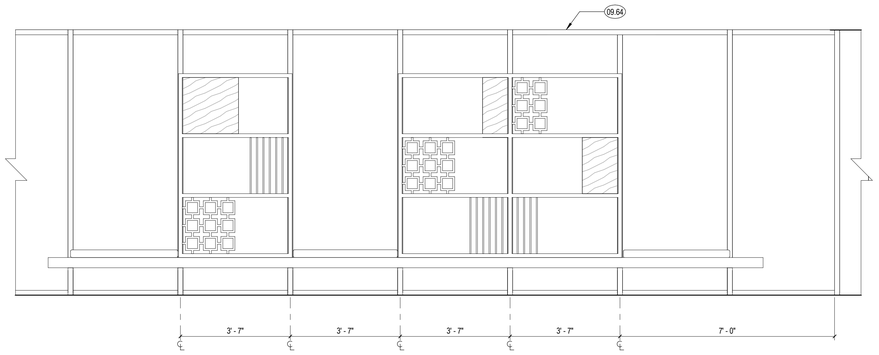
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

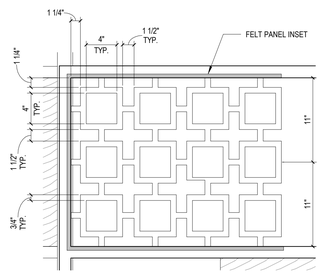
A290



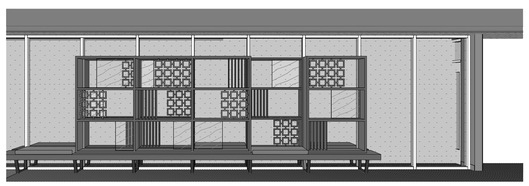
5 TEEN CASEWORK WALL - ELEVATION - E
1/2" = 1'-0"



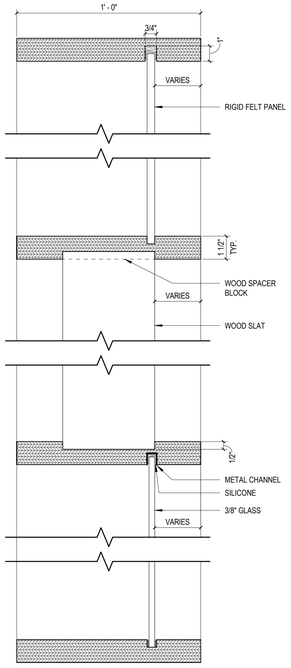
6 TEEN CASEWORK WALL - ELEVATION - W
1/2" = 1'-0"



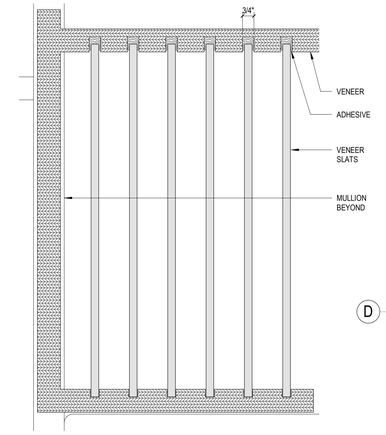
2 LASER CUT FELT - TYPICAL
1 1/2" = 1'-0"



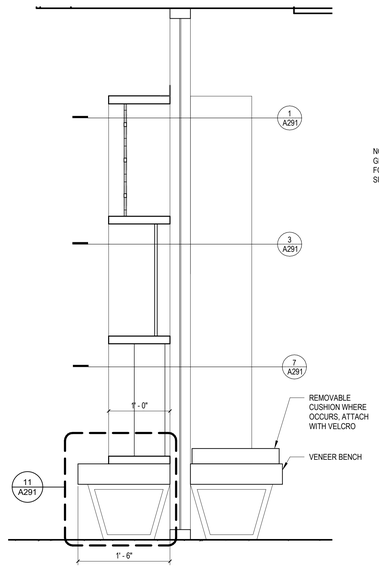
12 TEEN CASEWORK WALL - 3D VIEW (FOR REFERENCE ONLY)



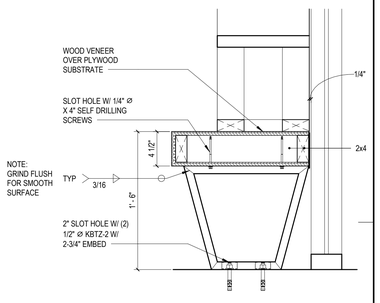
8 PANEL DETAILS
3" = 1'-0"



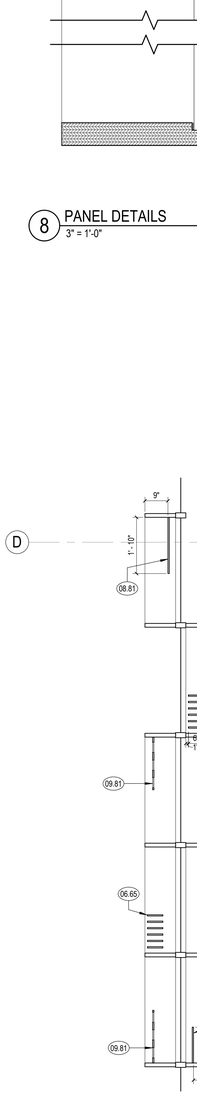
9 WOOD SLATS, TYP.
3" = 1'-0"



10 FULL HEIGHT BENCH SECTION
1" = 1'-0"

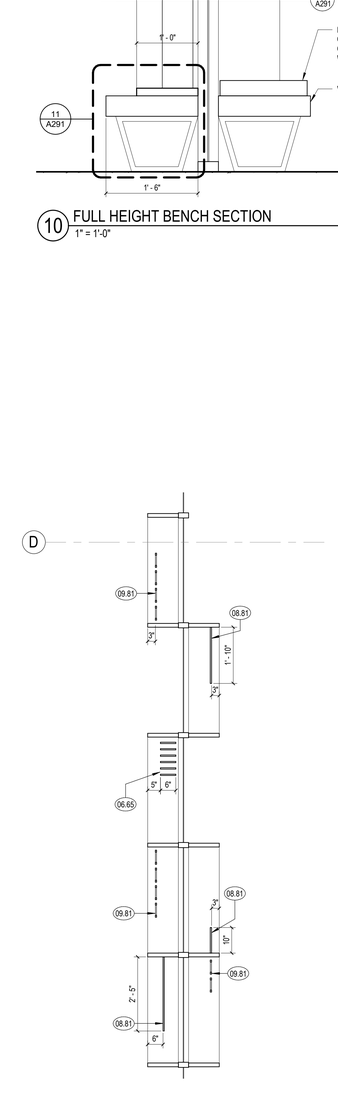


11 BENCH ATTACHMENT
1 1/2" = 1'-0"

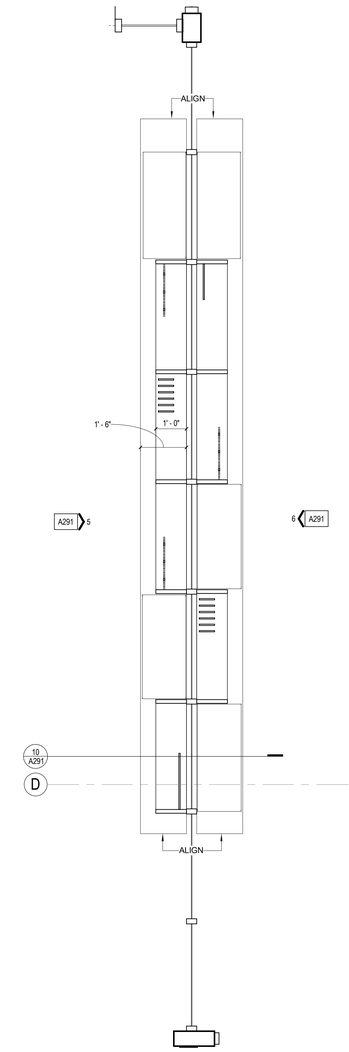


7 TEEN'S CASEWORK - 3
1/2" = 1'-0"

3 TEEN'S CASEWORK - 2
1/2" = 1'-0"



1 TEEN'S CASEWORK - 1
1/2" = 1'-0"



4 TEEN CASEWORK WALL - ENLARGED PLAN
1/2" = 1'-0"

SIGNAGE PLAN KEYNOTES

06.65	WOOD VENEER SLATS
08.81	1/2" THICK COLORED GLASS PANEL
09.64	SEE 5/A291 FOR SIMILAR CONDITIONS
09.81	LASER CUT RIGID ACOUSTIC FELT
10.62	SEAT CUSHION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

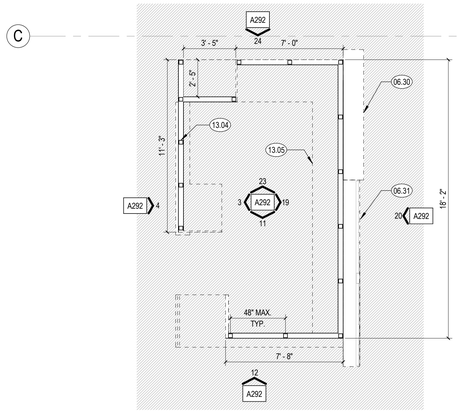
ENLARGED PLANS & ELEVATIONS

SCALE: As indicated

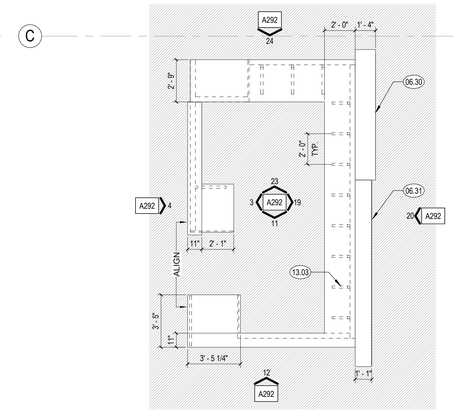
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A291

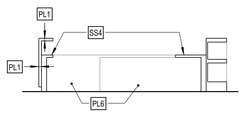
11/7/2024 3:17:56 PM



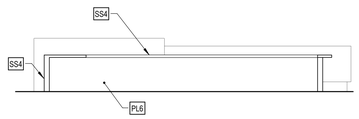
14 ENLARGED FOOR PLAN - RECEPTION DESK WALLS
1/4" = 1'-0"



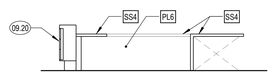
6 ENLARGED FOOR PLAN - RECEPTION DESK
1/4" = 1'-0"



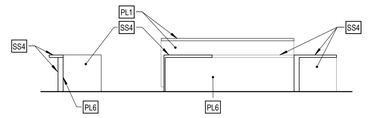
23 SERVICE DESK INTERIOR - N
1/4" = 1'-0"



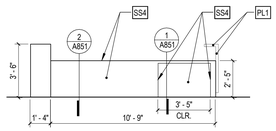
19 SERVICE DESK INTERIOR - E
1/4" = 1'-0"



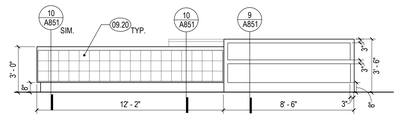
11 SERVICE DESK INTERIOR - S
1/4" = 1'-0"



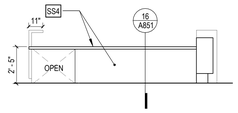
3 SERVICE DESK INTERIOR - W
1/4" = 1'-0"



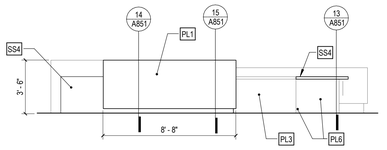
24 SERVICE DESK EXTERIOR - N
1/4" = 1'-0"



20 SERVICE DESK EXTERIOR - E
1/4" = 1'-0"



12 SERVICE DESK EXTERIOR - S
1/4" = 1'-0"



4 SERVICE DESK EXTERIOR - W
1/4" = 1'-0"

SHEET NOTES

KEYNOTES

06.30	ALL EXPOSED SURFACES, SIDES AND SHELVES OF CASEWORK UNIT TO BE PL1.
06.31	ALL EXPOSED SURFACES AND SIDES OF CASEWORK UNIT TO BE PL3 WITH THE EXCEPTION OF THE SALVAGED WOOD TILES.
09.20	(E) SALVAGED WOOD TILES, TYP. SEE EXISTING PHOTOS ON A161. COORDINATE SELECTION OF TILES FROM SALVAGED STOCK WITH ARCHITECT.
13.03	CONCEALED BRACKET, TYP. SEE DETAIL 12B/A851.
13.04	3" X 3" X 1/4" HSS, TYP. SEE DETAIL 12A/A851.
13.05	COUNTERTOP/CASEWORK

LEGEND

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

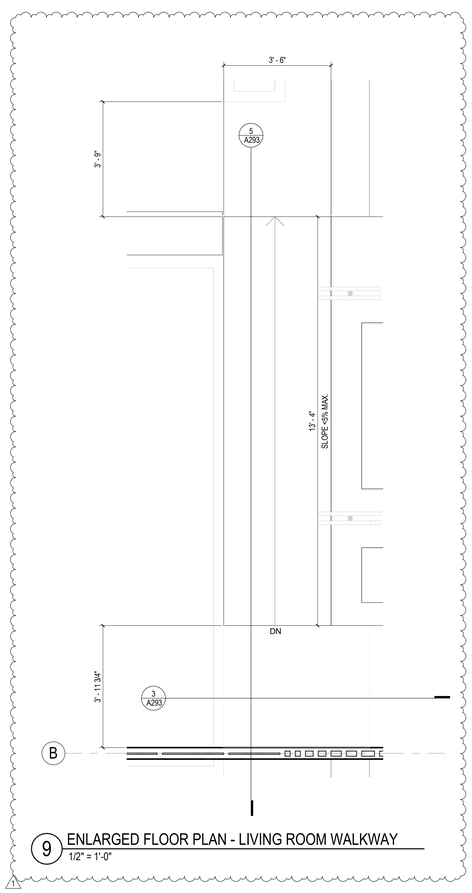
ENLARGED PLANS & ELEVATIONS

SCALE: 1/4" = 1'-0"

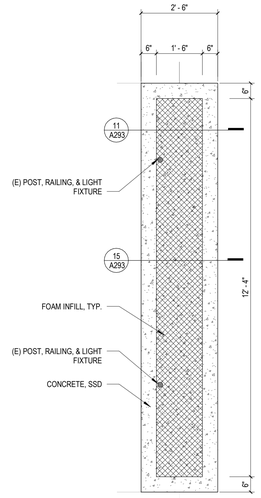
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A292

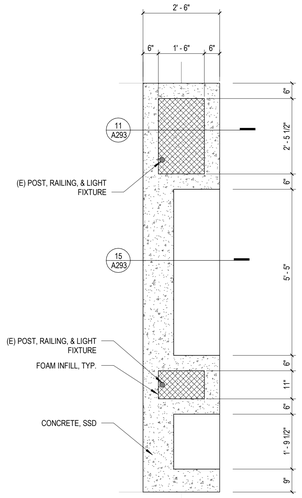
11/7/2024 5:57:27 PM



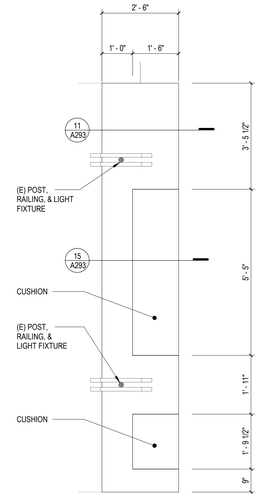
9 ENLARGED FLOOR PLAN - LIVING ROOM WALKWAY
1/2" = 1'-0"



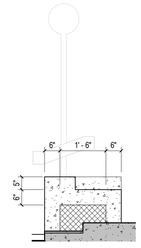
10 CONCRETE BENCH HORIZONTAL SECTION 2
1/2" = 1'-0"



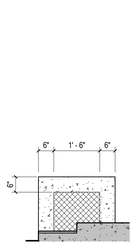
6 CONCRETE BENCH HORIZONTAL SECTION 1
1/2" = 1'-0"



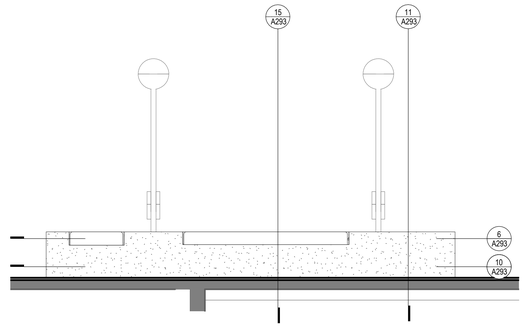
2 ENLARGED FLOOR PLAN - CONCRETE BENCH
1/2" = 1'-0"



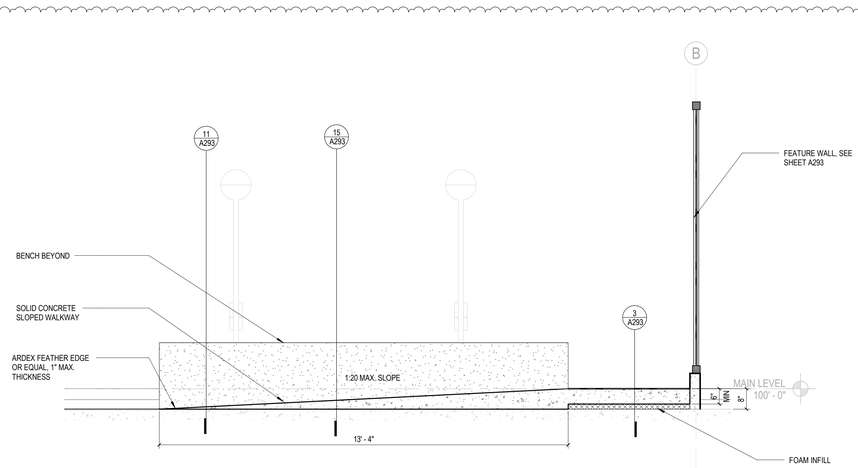
15 CONCRETE BENCH VERTICAL SECTION 02
1/2" = 1'-0"



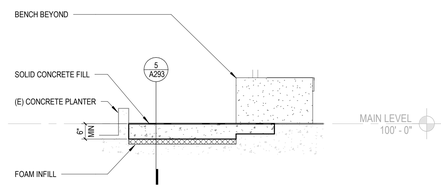
11 CONCRETE BENCH VERTICAL SECTION
1/2" = 1'-0"



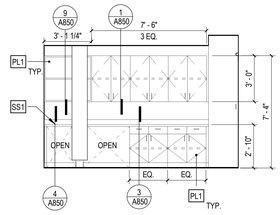
7 CONCRETE BENCH ELEVATION
1/2" = 1'-0"



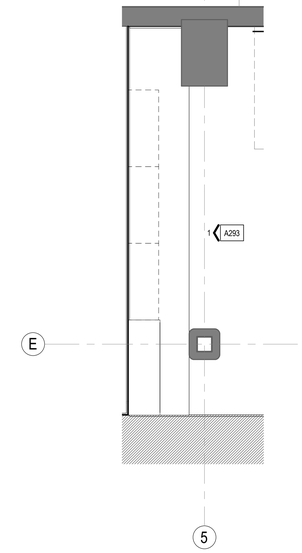
5 SECTION 1 @ SLOPED WALKWAY
1/2" = 1'-0"



3 SECTION 2 @ SLOPED WALKWAY
1/2" = 1'-0"



1 MAIN LEVEL - RECEIVING 313 - W
1/4" = 1'-0"



4 RECIEVING CASEWORK - ENLARGED PLAN
1/2" = 1'-0"

11/7/2024 3:18:08 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

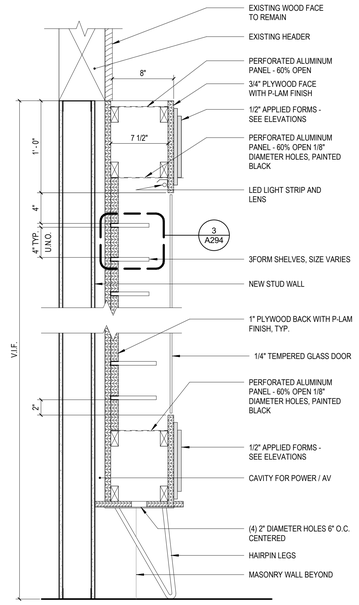
SHEET TITLE:

ENLARGED PLANS & ELEVATIONS

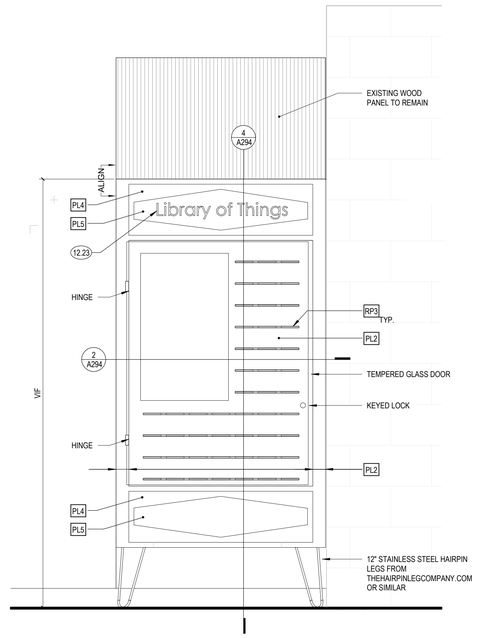
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

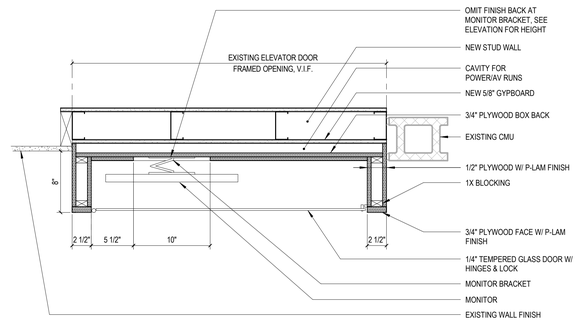
A293



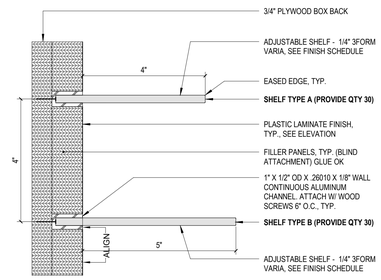
4 LIBRARY OF THINGS DISPLAY SECTION
1 1/2" = 1'-0"



1 LIBRARY OF THINGS DISPLAY
1" = 1'-0"



2 LIBRARY OF THINGS - PLAN SECTION
1 1/2" = 1'-0"



3 LIBRARY OF THINGS - SHELF SLOT DETAIL
6" = 1'-0"

SHEET NOTES

KEYNOTES

12.23 VINYL DECAL. COORDINATE CUSTOM FONT WITH ARCHITECT

LEGEND

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

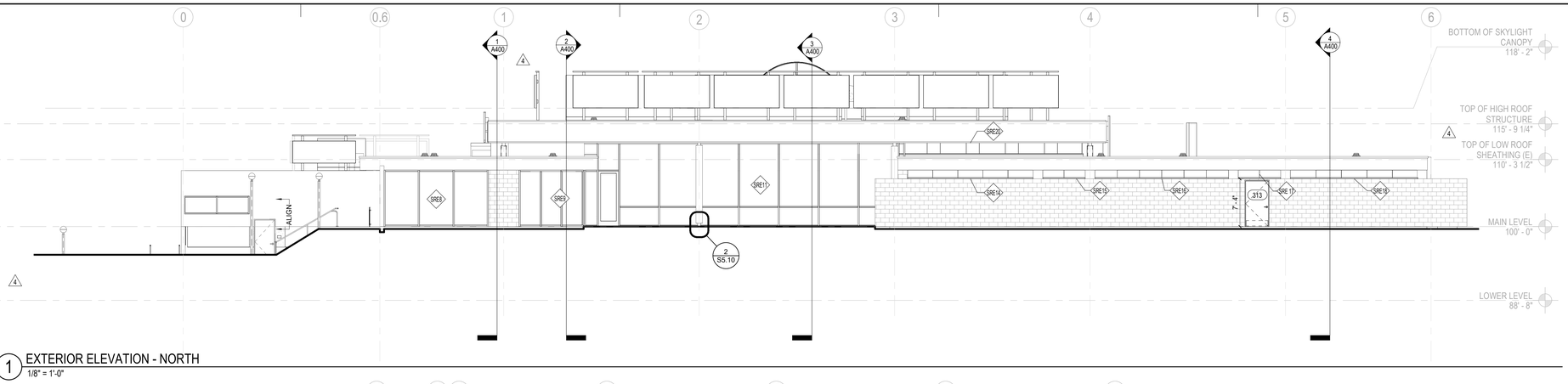
ENLARGED PLANS & ELEVATIONS

SCALE: As indicated

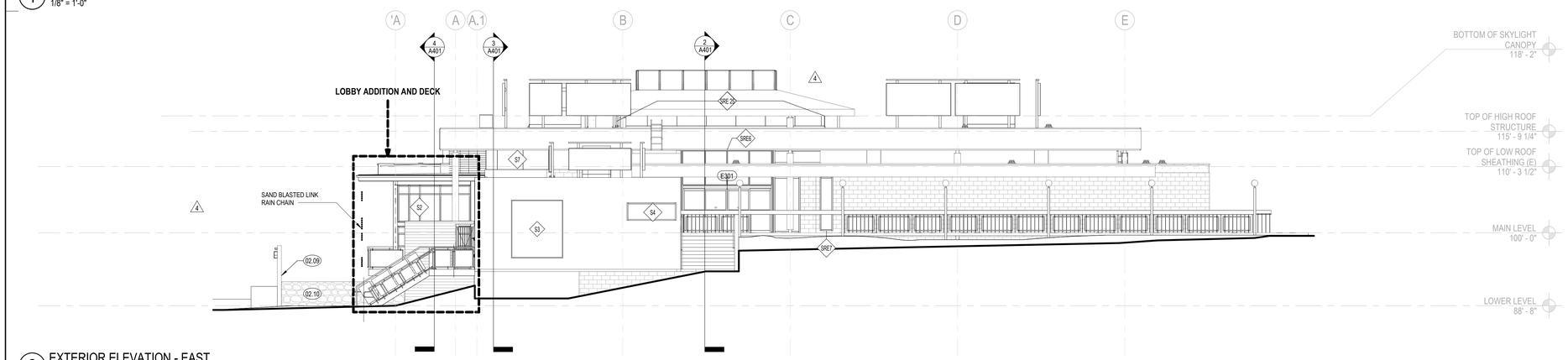
All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A294

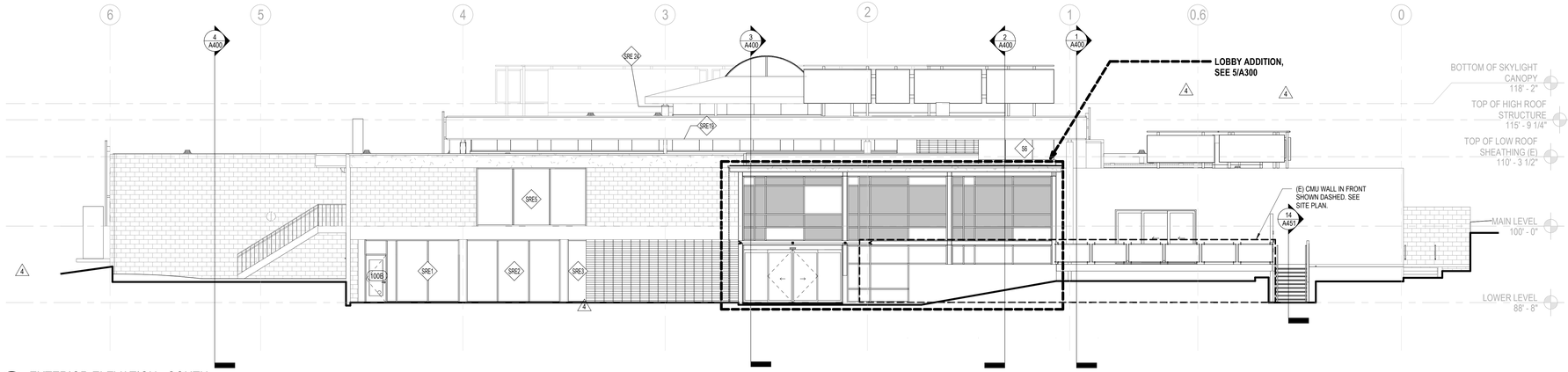
11/7/2024 3:18:11 PM



1 EXTERIOR ELEVATION - NORTH
1/8" = 1'-0"



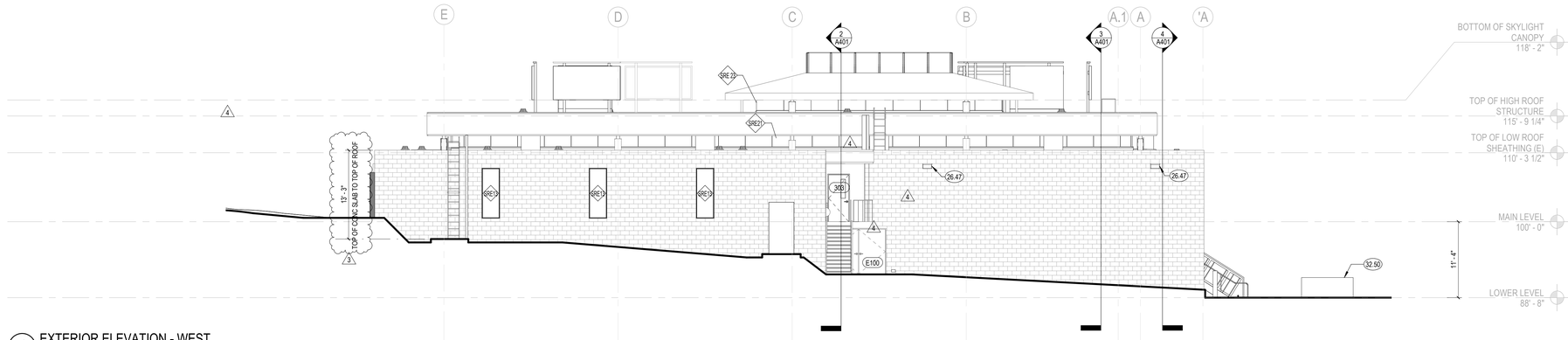
2 EXTERIOR ELEVATION - EAST
1/8" = 1'-0"



3 EXTERIOR ELEVATION - SOUTH
1/8" = 1'-0"



5 LOBBY ADDTION EXTERIOR



4 EXTERIOR ELEVATION - WEST
1/8" = 1'-0"

SHEET NOTES

A. PROVIDE ANTI-GRAFFITI COATING TO ALL ABOVE GRADE EXTERIOR EXPOSED CONCRETE, CMU AND PAINTED CEMENT PLASTER. ALIGN TERMINATION OF COATING UNIFORMLY TO NEAREST HORIZONTAL CLADDING JOINT, CHANGE IN PLANE, OR TRANSITION NOT LESS THAN 6'-0" A.F.F., U.N.O.

B. ALL EXPOSED STRUCTURAL STEEL SHALL RECEIVE FIELD-APPLIED HIGH PERFORMANCE COATING. COLOR TO BE SELECTED BY ARCHITECT. SEE SPECIFICATIONS.

C. FOR LOCATION OF CMU WALLS, SEE LEGEND. ALL OTHER EXTERIOR WALLS ARE CEMENT PLASTER.

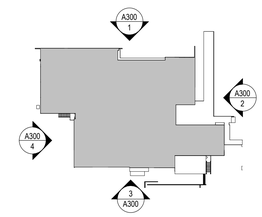
KEYNOTES

02.09	(E) CMU WALL
02.10	(E) STONE WALL
26.47	(E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL
32.50	SITE WALL, SLD.

LEGEND

###	DOOR TAG
E###	EXISTING (E) DOOR TO REMAIN
S#	WINDOW TAG
SRE#	STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
	(E) CMU
	12X4X16 CMU IN STACKED BOND
	GLAZING FRIT DESIGN
	CEDAR CLADDING

KEY PLAN



ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

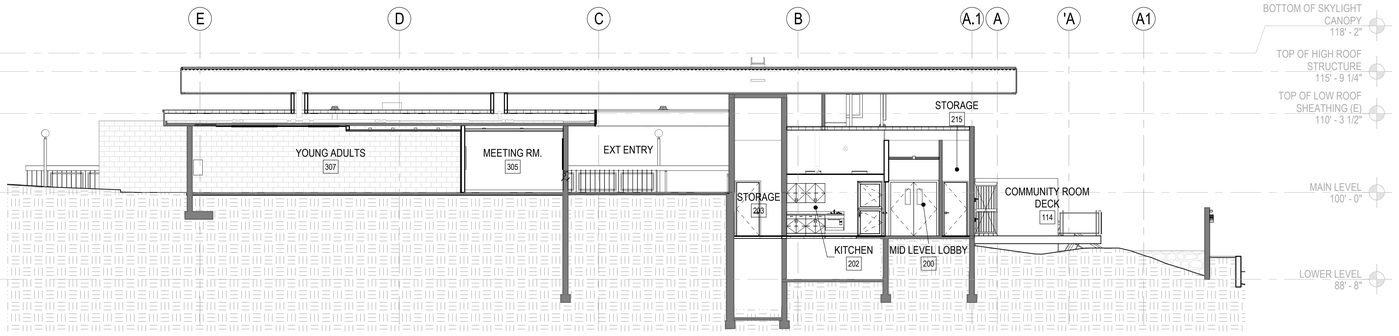
EXTERIOR ELEVATIONS

SCALE: As indicated

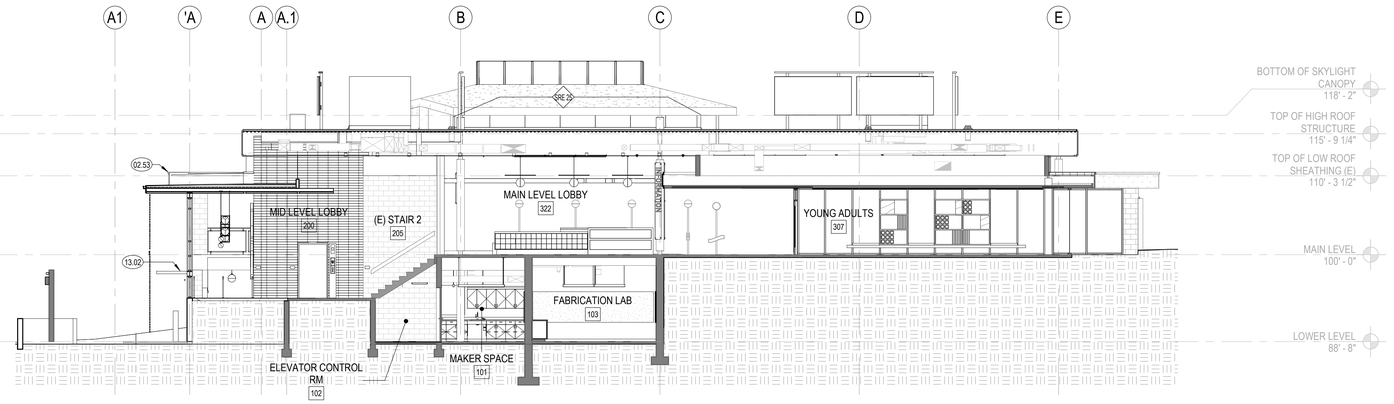
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A300

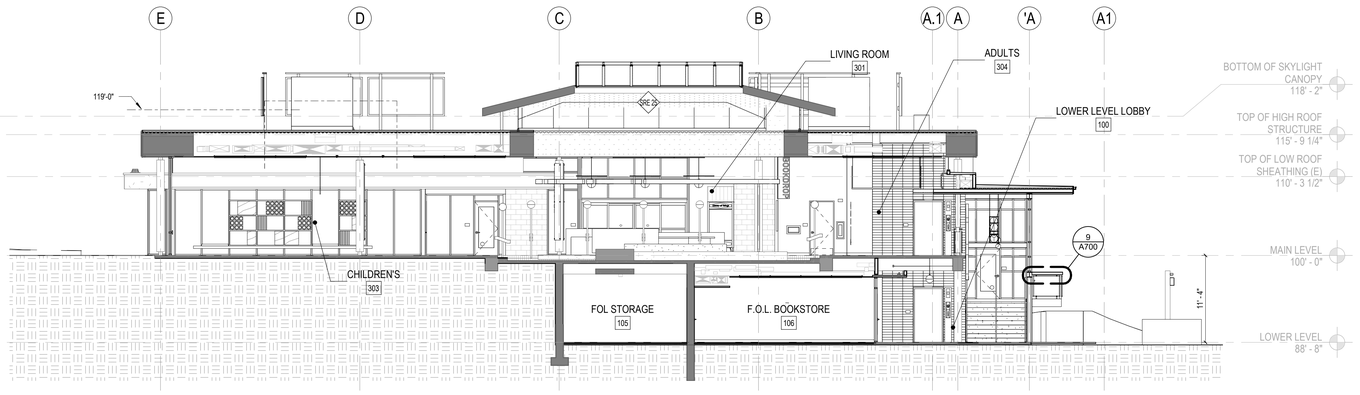
6/12/2025 3:47:33 PM



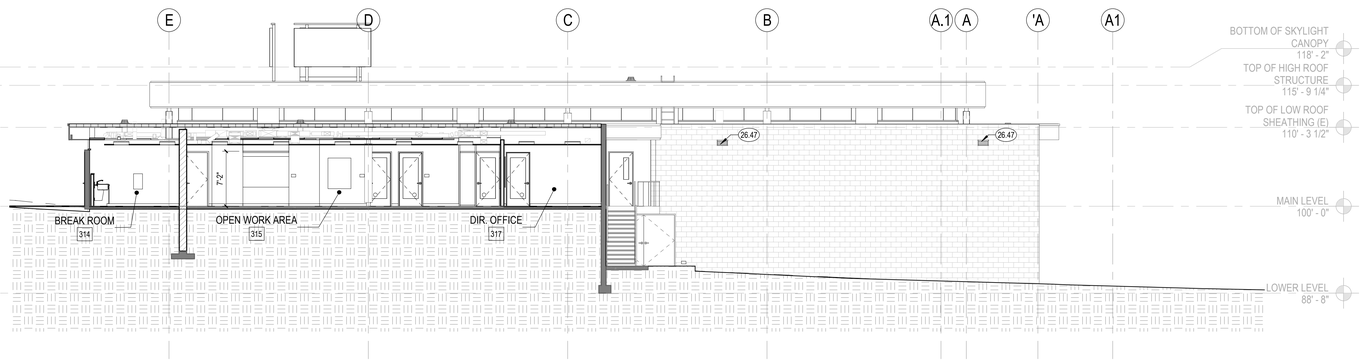
1 BUILDING SECTION 1, NORTH - SOUTH
1/8" = 1'-0"



2 BUILDING SECTION 2, NORTH - SOUTH
1/8" = 1'-0"



3 BUILDING SECTION 3, NORTH-SOUTH
1/8" = 1'-0"



4 BUILDING SECTION 4, NORTH-SOUTH
1/8" = 1'-0"

11/7/2024 3:18:34 PM

SHEET NOTES

A. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
B. PROVIDE ACCESS PANELS AS REQUIRED PER APPLICABLE CODES FOR MAINTENANCE ACCESS TO INSTALLED MEP EQUIPMENT. PROVIDE STAINLESS STEEL ACCESS PANELS AT CERAMIC TILE LOCATIONS. COORDINATE TYPES AND LOCATIONS OF WALL ACCESS PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
C. MATCH EXISTING STUD DIMENSION WHERE NEW PARTITION FRAMING ALIGNS WITH EXISTING PARTITION. STUD SIZE INDICATED IN WALL TYPE SHALL BE VERIFIED BY CONTRACTOR AT THESE CONDITIONS.
D. ADJACENT IN-LINE PARTITIONS OF DIFFERENT TYPES SHALL BE CONSTRUCTED SUCH THAT EXPOSED FINISH SURFACES ARE FLUSH AND CONTINUOUS.
E. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.
F. FOR WALLS BUTTING INTO EXTERIOR WINDOWS, SEE 13 / A801

KEYNOTES

02.53 (E) FASCIA TO BE PRESERVED IN PLACE
13.02 MTL CANOPY
26.47 (E) LIGHT FIXTURES TO REMAIN, PROTECT IN PLACE OR REMOVE AND REINSTALL

LEGEND

PARTITION, FLOOR, OR ROOF SEE PARTITION TYPES ON SHEET A800
EXISTING (E) WALL, FLOOR, OR ROOF TO REMAIN
F1.AH WALL TAG
DOOR TAG
E### EXISTING (E) DOOR TO REMAIN
S# WINDOW TAG
SRE# STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
CMU

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

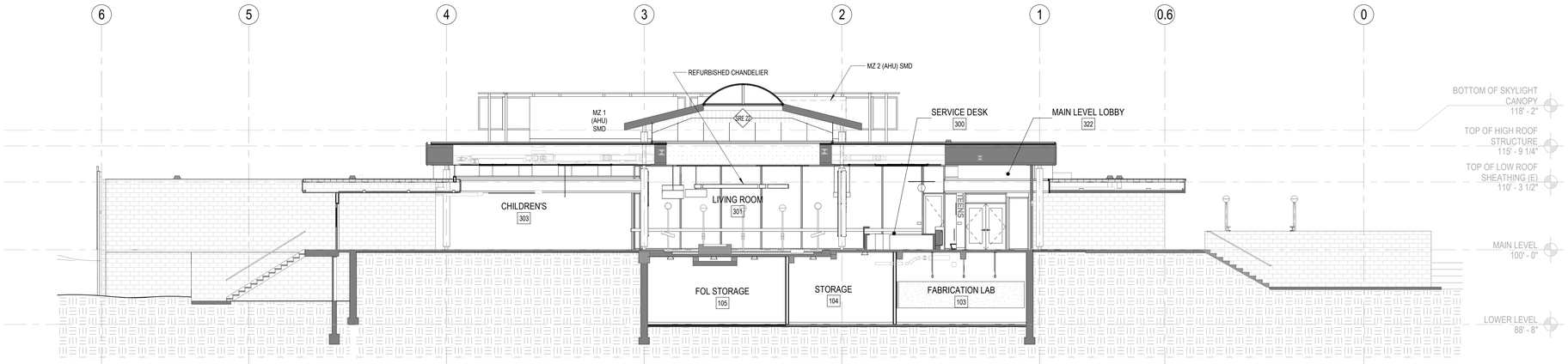
SHEET TITLE:

BUILDING SECTIONS

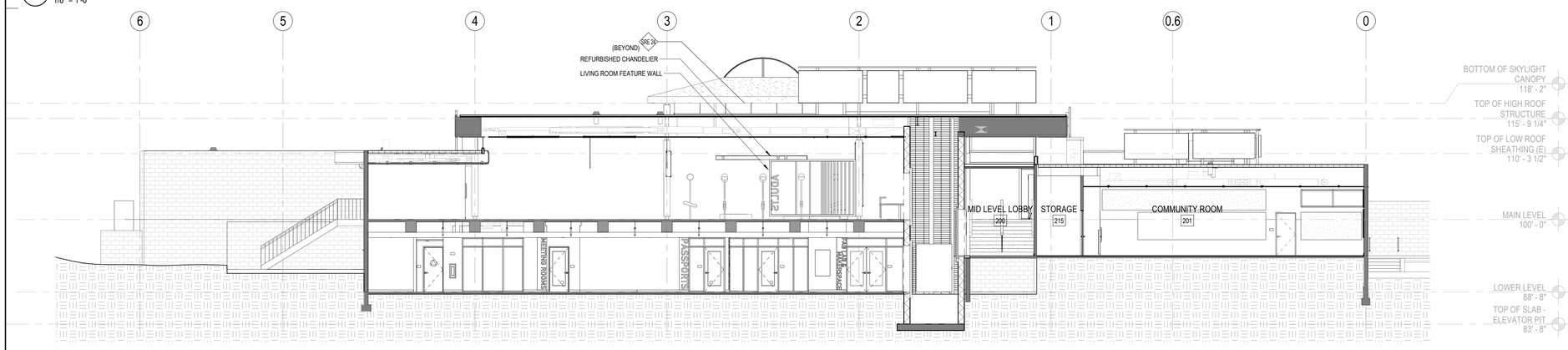
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brule Architects and may not be duplicated without the written consent of Anderson-Brule Architects. ©

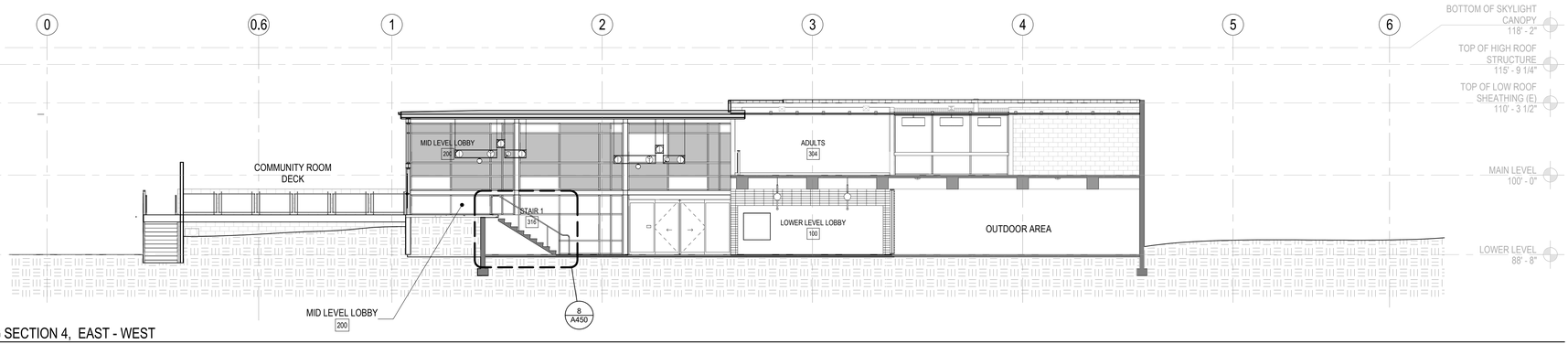
A400



2 BUILDING SECTION 2, EAST - WEST
1/8" = 1'-0"



3 BUILDING SECTION 3, EAST - WEST
1/8" = 1'-0"



4 BUILDING SECTION 4, EAST - WEST
1/8" = 1'-0"

SHEET NOTES

A. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO WORK.
B. PROVIDE ACCESS PANELS AS REQUIRED PER APPLICABLE CODES FOR MAINTENANCE ACCESS TO INSTALLED MEP EQUIPMENT. PROVIDE STAINLESS STEEL ACCESS PANELS AT CERAMIC TILE LOCATIONS. COORDINATE TYPES AND LOCATIONS OF WALL ACCESS PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
C. MATCH EXISTING STUD DIMENSION WHERE NEW PARTITION FRAMING ALIGNS WITH EXISTING PARTITION. STUD SIZE INDICATED IN WALL TYPE SHALL BE VERIFIED BY CONTRACTOR AT THESE CONDITIONS.
D. ADJACENT IN-LINE PARTITIONS OF DIFFERENT TYPES SHALL BE CONSTRUCTED SUCH THAT EXPOSED FINISH SURFACES ARE FLUSH AND CONTINUOUS.
E. PATCH AND REPAIR EXISTING WALLS WHERE DAMAGED DUE TO REMOVAL OF WOOD TRIM, HANDRAILS, AND OTHER ITEMS.
F. FOR WALLS BUTTING INTO EXTERIOR WINDOWS, SEE 13 / A801

KEYNOTES

LEGEND

- PARTITION, FLOOR, OR ROOF SEE PARTITION TYPES ON SHEET A800
- EXISTING (E) WALL, FLOOR, OR ROOF TO REMAIN
- F1.AH — WALL TAG
- ### — DOOR TAG
- E### — EXISTING (E) DOOR TO REMAIN
- S# — WINDOW TAG
- SRE# — STOREFRONT TO REPLACE EXISTING (E) WINDOW IN KIND
- CMU

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

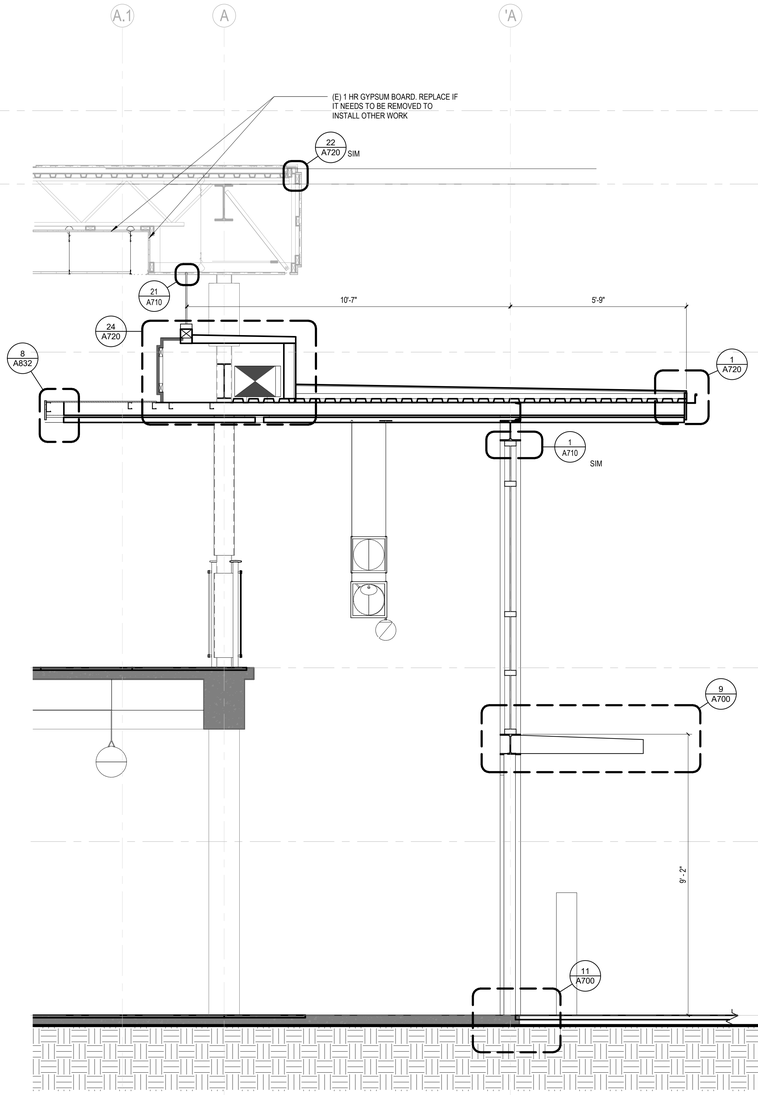
BUILDING SECTIONS

SCALE: 1/8" = 1'-0"

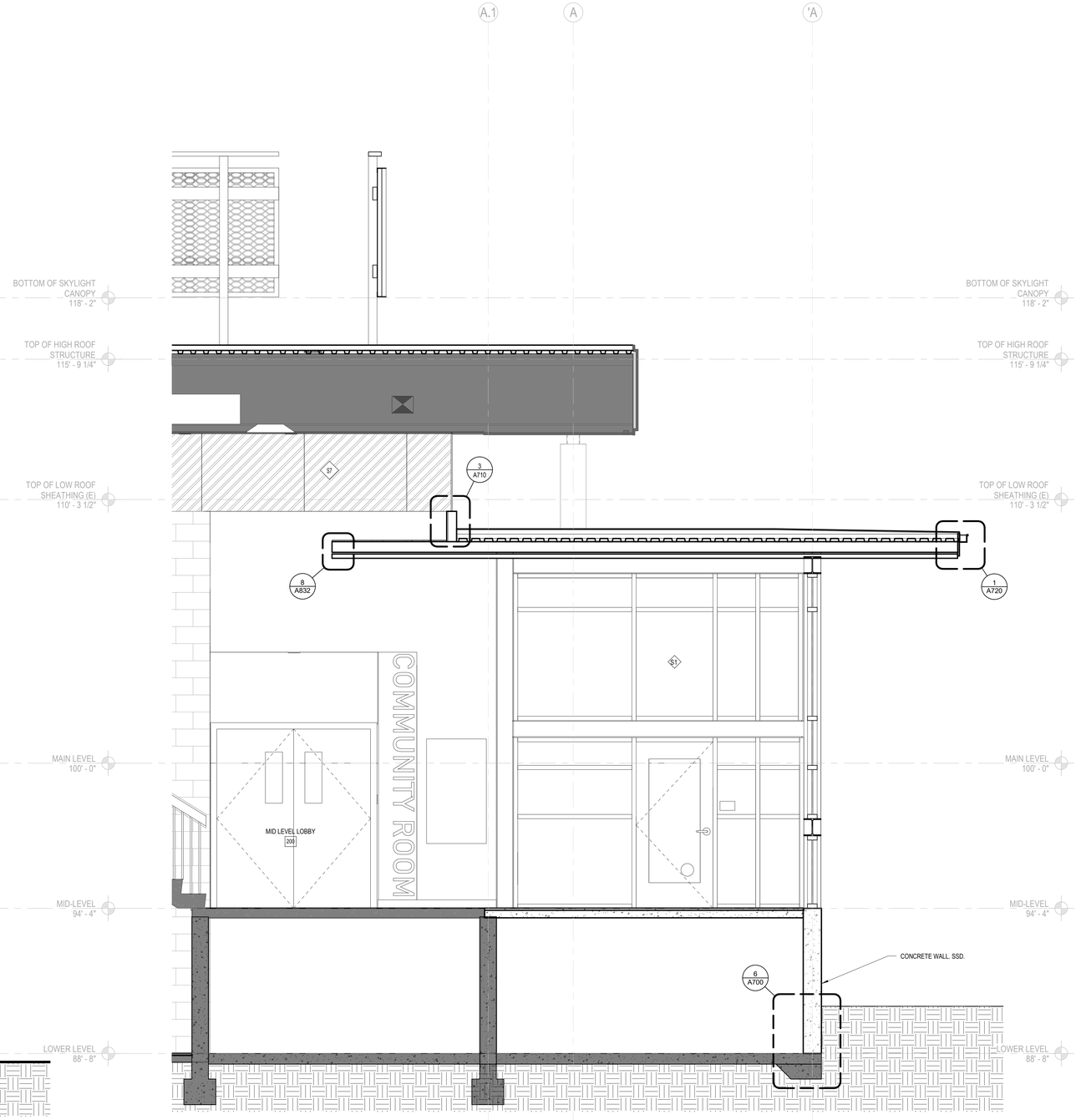
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A401

11/7/2024 3:18:42 PM



3 WALL SECTION @ SOUTH SIDE ENTRANCE
1/2" = 1'-0"



2 SOUTH SIDE WALL SECTION @ MID LEVEL LOBBY
1/2" = 1'-0"

1/7/2024 3:16:45 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

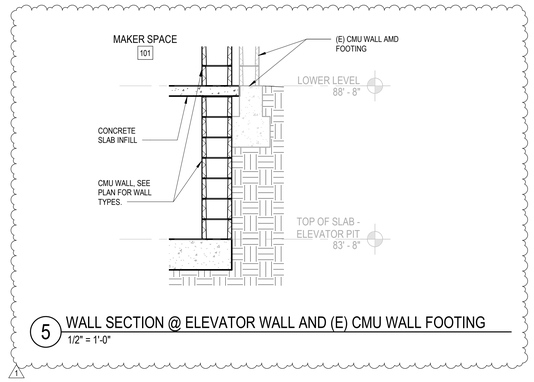
SHEET TITLE:

WALL SECTIONS

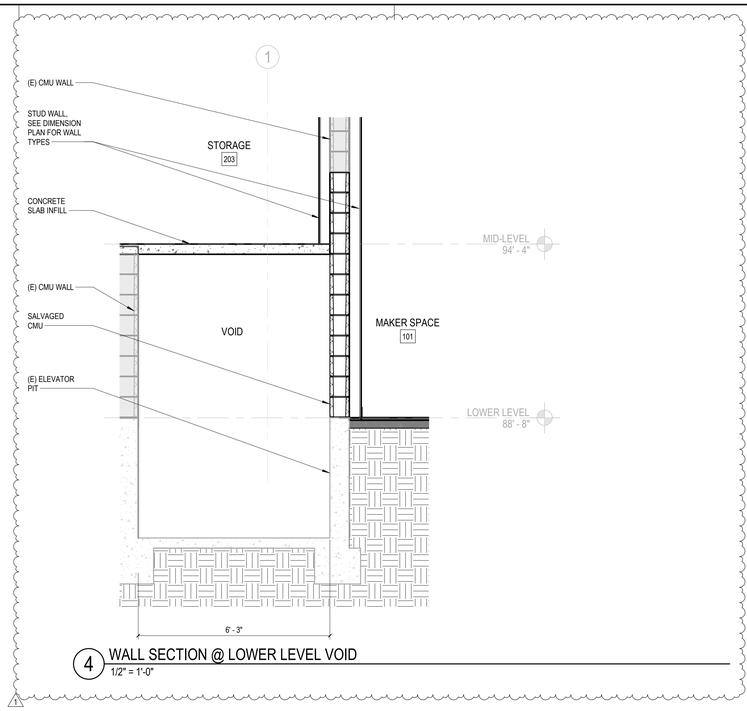
SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

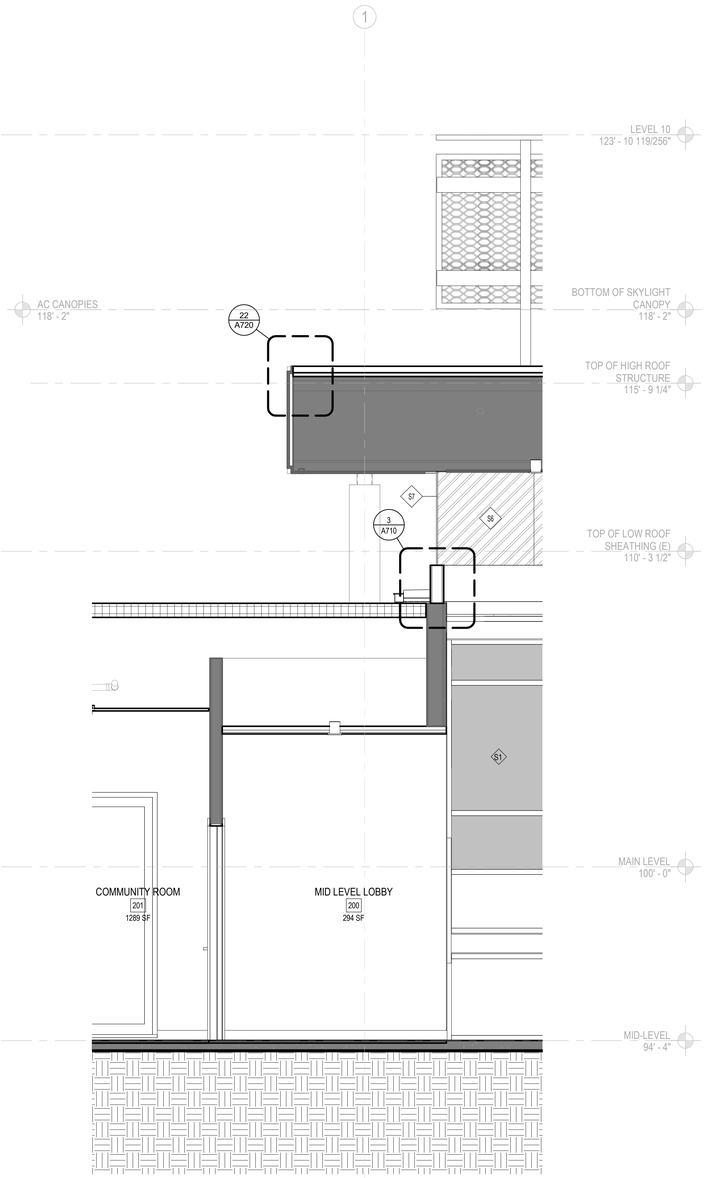
A410



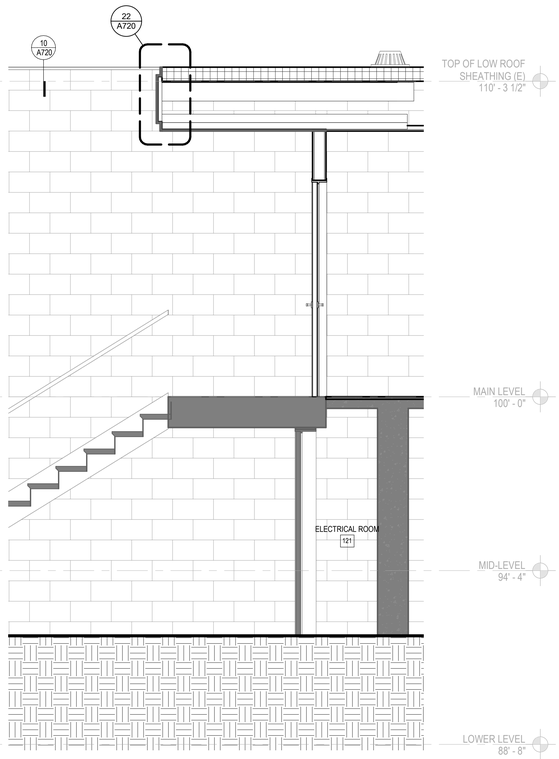
5 WALL SECTION @ ELEVATOR WALL AND (E) CMU WALL FOOTING
1/2" = 1'-0"



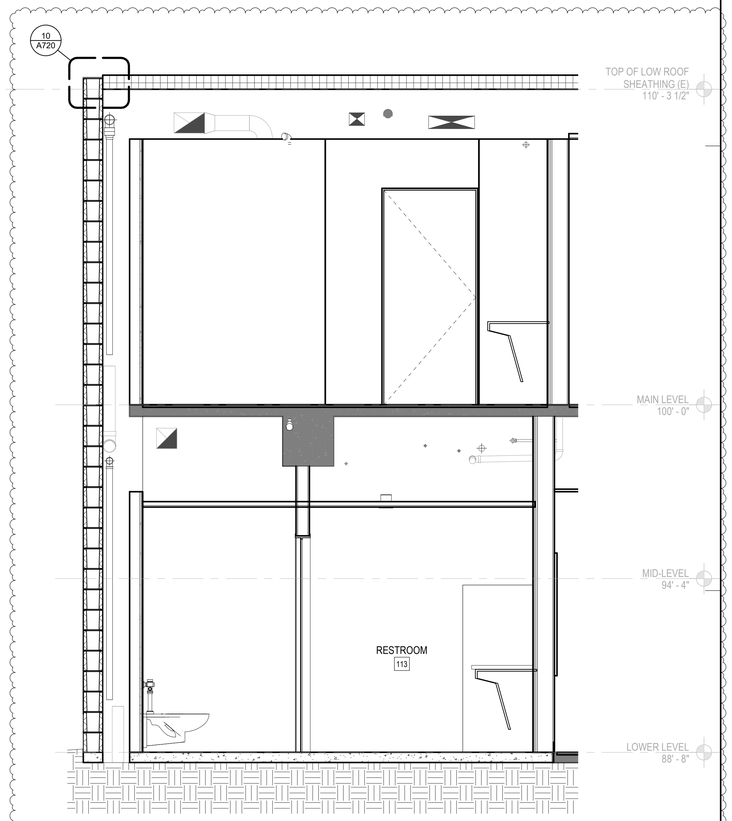
4 WALL SECTION @ LOWER LEVEL VOID
1/2" = 1'-0"



3 WALL SECTION @ COMMUNITY ROOM
1/2" = 1'-0"



2 WALL SECTION @ WEST (E) STAIR
1/2" = 1'-0"



1 WALL SECTION @ LOWER LEVEL RESTROOMS
1/2" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

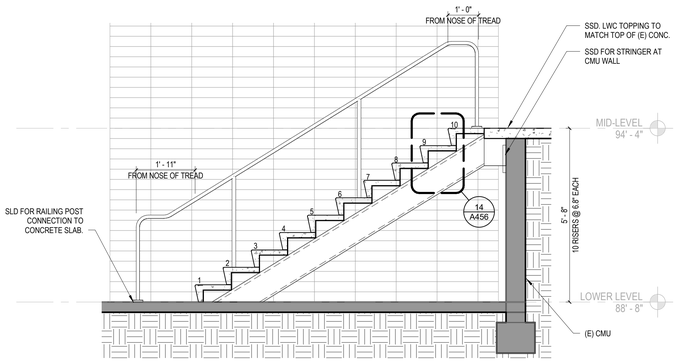
WALL SECTIONS

SCALE: 1/2" = 1'-0"

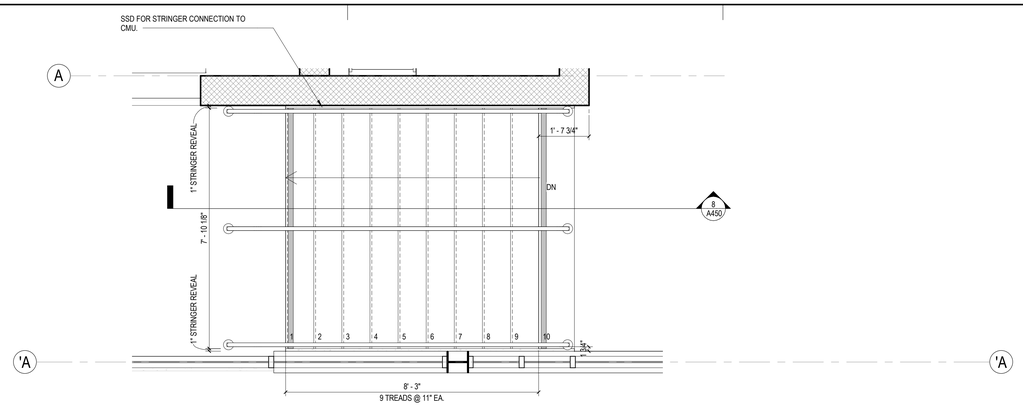
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A411

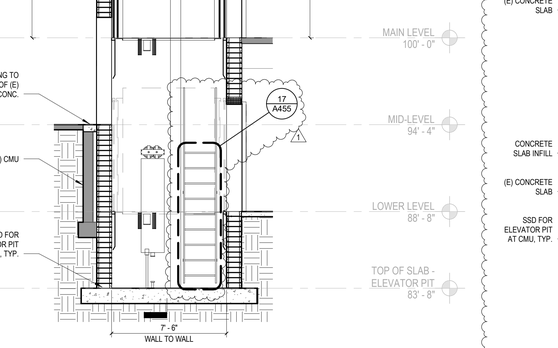
11/7/2024 4:17:07 PM



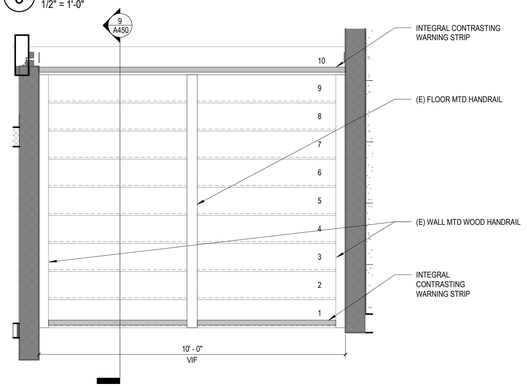
8 STAIR 1A SECTION - E-W
1/2" = 1'-0"



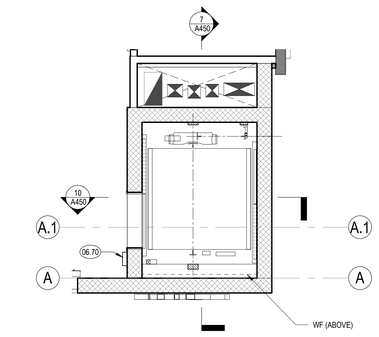
5 STAIR 1A -ENLARGED PLAN
1/2" = 1'-0"



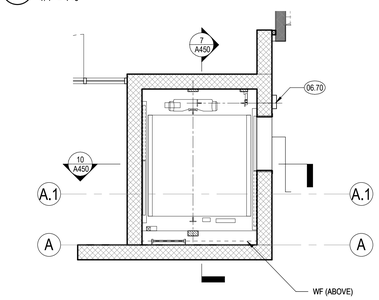
9 (E) STAIR 2 - SECTION N-S
1/2" = 1'-0"



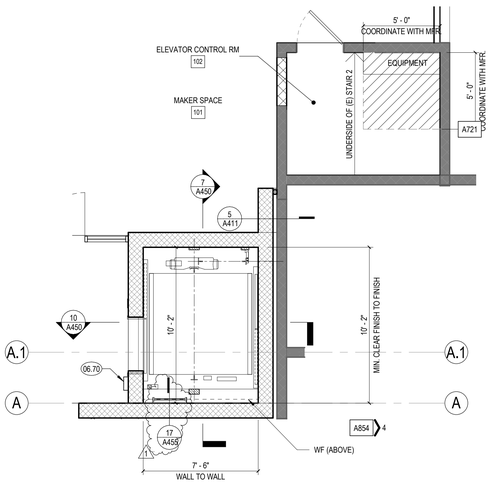
6 (E) STAIR 2 - ENLARGED PLAN
1/2" = 1'-0"



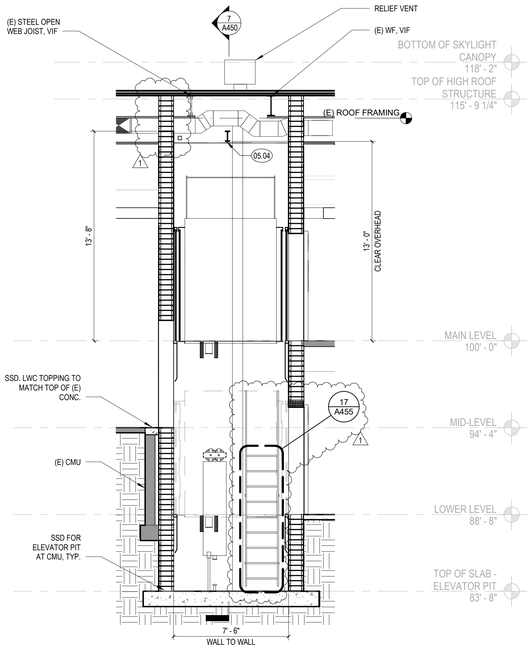
2 ENLARGED PLAN - ELEVATOR @ MAIN LEVEL
1/4" = 1'-0"



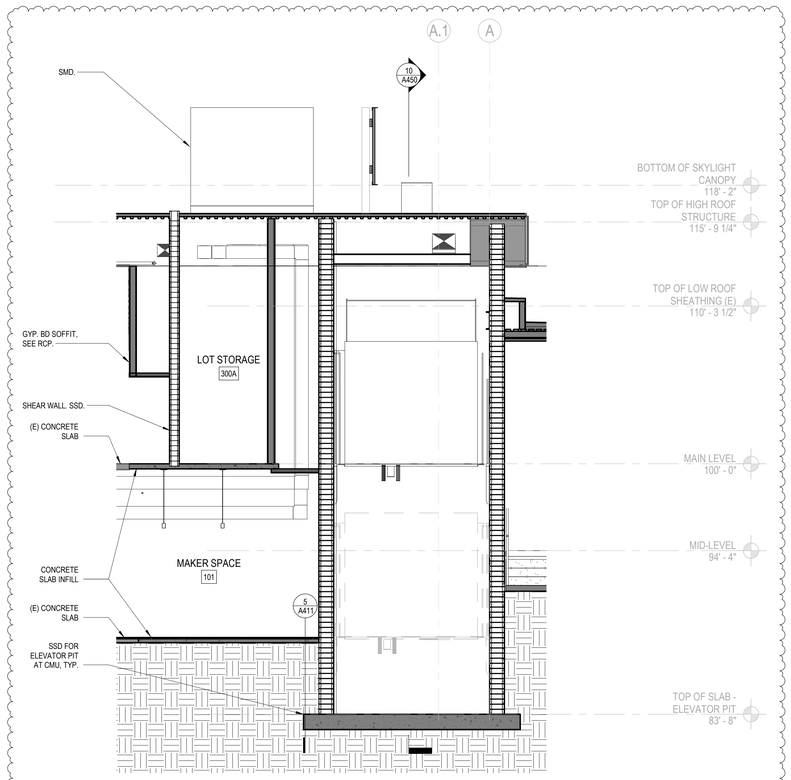
3 ENLARGED PLAN - ELEVATOR @ MID LEVEL
1/4" = 1'-0"



4 ENLARGED PLAN - ELEVATOR AND CONTROL RM @ LOWER LEVEL
1/4" = 1'-0"



10 ELEVATOR SECTION E-W
1/4" = 1'-0"



7 ELEVATOR SECTION N-S
1/4" = 1'-0"

KEYNOTES

05.04 8" HOISTBEAM BY KONE, INSTALLED BY OTHERS
06.70 ELEVATOR CALL BOX OUT. SEE DETAIL 22/A451.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	04/12/2024	PLANNING SUBMITTAL
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024

SHEET TITLE:

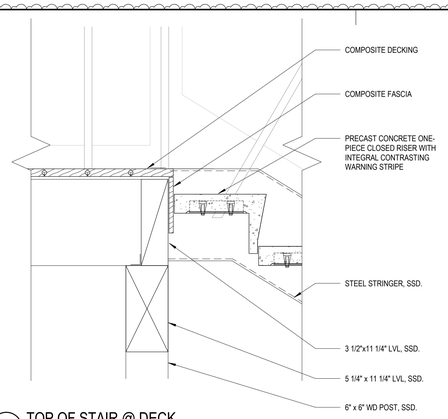
STAIR AND ELEVATOR SECTIONS, ENLARGED PLANS, AND DETAILS

SCALE: As indicated

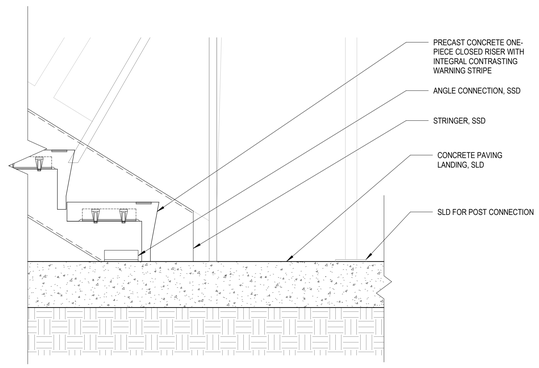
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A450

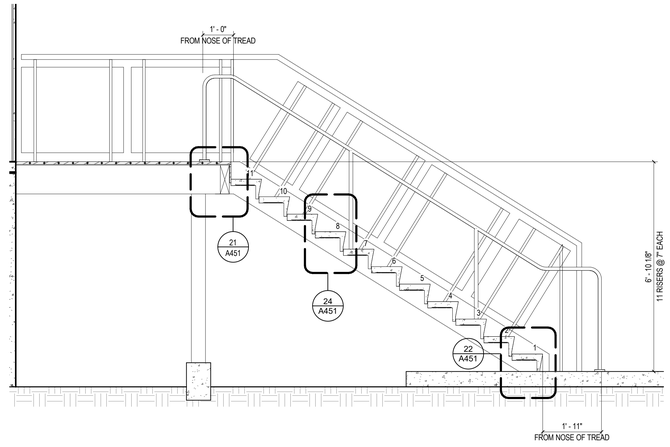
11/7/2024 5:57:35 PM



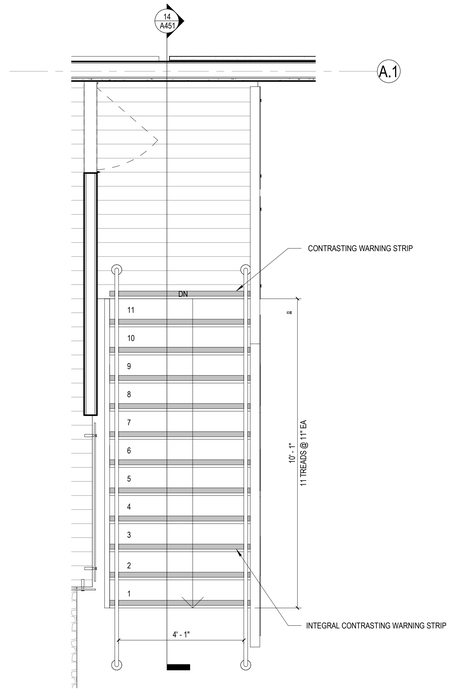
21 TOP OF STAIR @ DECK
1 1/2" = 1'-0"



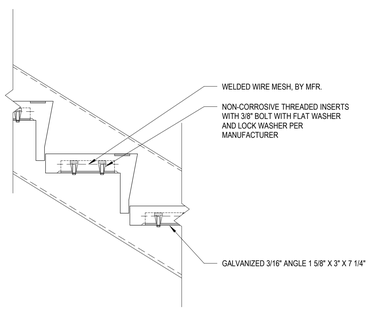
22 BOTTOM OF STAIR @ CONCRETE PAVING
1 1/2" = 1'-0"



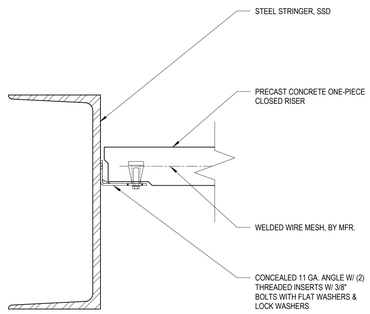
14 COMMUNITY ROOM DECK STAIR - SECTION N-S
1/2" = 1'-0"



6 COMMUNITY ROOM DECK STAIR - ENLARGED PLAN
1/2" = 1'-0"



24 STAIR TREAD/RISER SECTION
1 1/2" = 1'-0"



16 STAIR END DETAIL
3" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

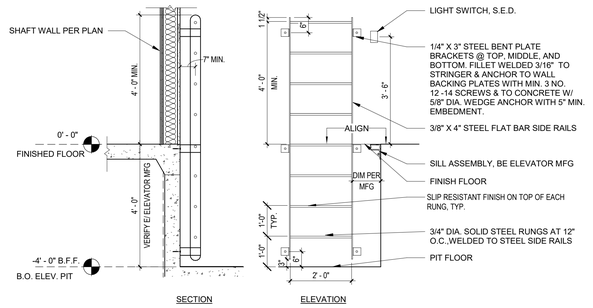
STAIR SECTIONS, ENLARGED PLANS, AND DETAILS

SCALE: As indicated

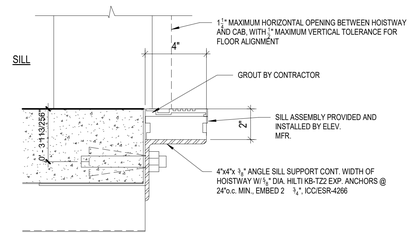
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A451

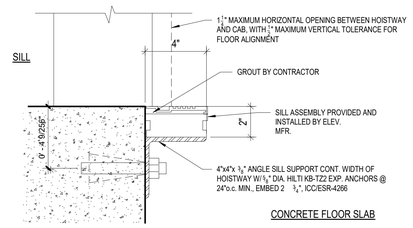
11/7/2024 3:16:59 PM



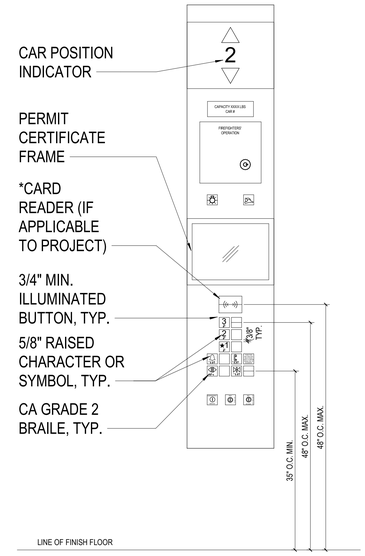
17 ELEVATOR PIT LADDER
1/2" = 1'-0"



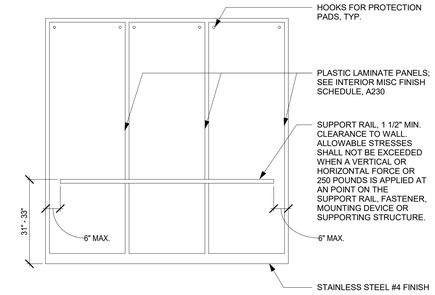
CONC / MTL DECK FLOOR SLAB B



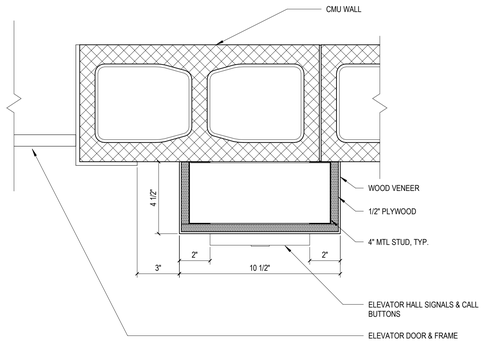
CONCRETE FLOOR A



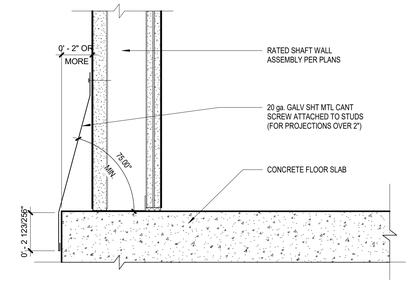
6 ELEVATOR CONTROL PANEL
1" = 1'-0"



1 ELEVATOR CAB REAR ENTRANCE
1/2" = 1'-0"



22 ELEVATOR CALL BOX OUT
3" = 1'-0"



2 ELEVATOR SHAFT LEDGE OVER 2" WIDE
3" = 1'-0"

10 ELEVATOR DOOR HEAD SILLS
3" = 1'-0"

1. ELEVATOR CAR CONTROLS SHALL COMPLY WITH CBC 11B-407.6 AND 11B-309.4.

2. CONTROLS SHALL BE LOCATED WITHIN ONE OF THE REACH RANGES SPECIFIED IN CBC 11B-308.

3. CALL BUTTONS SHALL HAVE SQUARE SHOULDERS, BE 3/4" MINIMUM IN SMALLEST DIMENSION, AND BE RAISED 1/8" PLUS OR MINUS 1/32" ABOVE THE SURROUNDING SURFACE IN COMPLIANCE WITH CBC 11B-407.4.6.2.1.

4. CALL BUTTONS SHALL BE ARRANGED WITH NUMBERS IN ASCENDING ORDER, OR WHEN TWO OR MORE COLUMNS OF BUTTONS ARE PROVIDED SHALL READ FROM LEFT TO RIGHT IN COMPLIANCE WITH 11B-407.6.2.2.

5. CAR CONTROL BUTTONS SHALL BE ILLUMINATED IN COMPLIANCE WITH 11B-407.4.6.2.3. BUTTONS WITH FLOOR DESIGNATIONS SHALL BE PROVIDED WITH VISIBLE INDICATORS TO SHOW A CALL HAS BEEN REGISTERED AND THAT WILL EXTINGUISH WHEN THE CAR ARRIVES AT THE DESIGNATED FLOOR IN COMPLIANCE WITH 11B-407.4.1.4.

6. CAR CONTROL BUTTONS SHALL BE ACTIVATED BY A MECHANICAL MOTION THAT IS DETECTABLE IN COMPLIANCE WITH 11B-407.4.6.2.4.

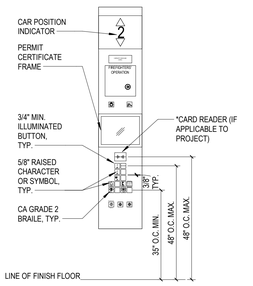
7. CONTROL BUTTONS EMERGENCY STOP, ALARM, DOOR OPEN, DOOR CLOSE, MAIN ENTRY FLOOR AND PHONE SHALL BE IDENTIFIED WITH RAISED SYMBOLS AND BRAILLE IN COMPLIANCE WITH CBC 11B-407.4.7.1.3 & TABLE 11B-407.4.7.1.3. EMERGENCY CONTROL BUTTONS INCLUDING THE EMERGENCY ALARM SHALL HAVE THEIR CENTERLINE 35" MINIMUM ABOVE FINISHED FLOOR AND BE GROUPED AT BOTTOM OF THE CONTROL PANEL IN COMPLIANCE WITH CBC 11B-407.4.6.4.1 & 11B-407.4.6.4.2.

8. CONTROL BUTTONS SHALL BE IDENTIFIED BY RAISED CHARACTERS OR SYMBOLS, WHITE ON BLACK BACKGROUND IN COMPLIANCE WITH 11B-703.2 AND BRAILLE IN COMPLIANCE WITH 11B-703.3. RAISED CHARACTERS OR SYMBOLS AND BRAILLE DESIGNATIONS SHALL BE PLACED IMMEDIATELY TO THE LEFT OF THE CONTROL BUTTONS TO WHICH THE DESIGNATIONS APPLY IN COMPLIANCE WITH CBC 11B-407.4.7.1.1. & 11B-407.4.7.1.2.

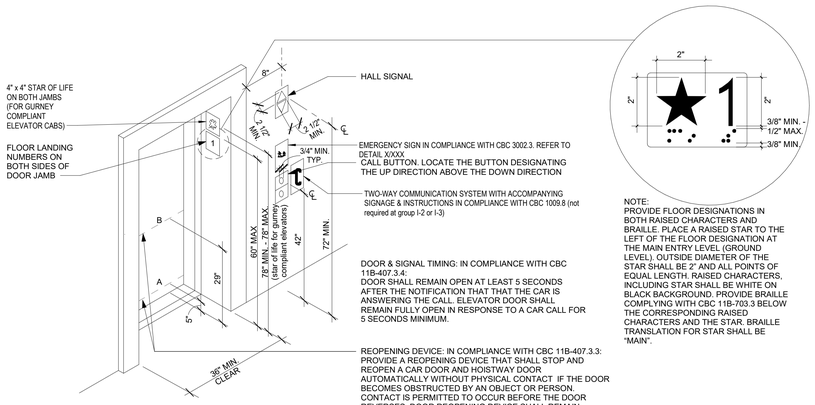
9. CAR BUTTON SPACING OF 3/8" CLEAR MINIMUM SHALL BE PROVIDED BETWEEN ROWS OF CONTROL BUTTONS IN COMPLIANCE WITH 11B-407.4.7.1.5.

10. CAR POSITION INDICATORS SHALL BE PROVIDED WITH AUDIBLE AND VISIBLE CHARACTERS THAT ARE 1/2" HIGH MINIMUM AND SHALL BE LOCATED ABOVE THE CAR CONTROL PANEL OR ABOVE THE DOOR, IN COMPLIANCE WITH CBC 11B-407.8.1.1 & 11B-407.4.8.1.2. AS THE CAR PASSES A FLOOR AND WHEN THE CAR STOPS AT A FLOOR SERVED BY THE ELEVATOR, THE CORRESPONDING CHARACTER SHALL ILLUMINATE IN COMPLAINCE WITH CBC 11B-407.4.8.1.3. THE AUDIBLE SIGNAL SHALL BE AN AUTOMATIC VERBAL ANNUNCIATOR WHICH ANNOUNCES THE FLOOR AT WHICH THE CAR IS ABOUT TO STOP, SHALL BE 10dB MINIMUM ABOVE AMBIENT, BUT SHALL NOT EXCEED 80dB MEASURED AT THE ANNUNICATOR, AND SHALL HAVE A FREQUENCY OF 300 Hz MINIMUM TO 3000 Hz MAXIMUM IN COMPLIANCE WITH CBC 11B-407.4.8.2.1, 11B-407.4.8.2.2 & 11B-407.4.8.2.3.

11. PROVIDE TWO-WAY EMERGENCY COMMUNICATION SYSTEM IN COMPLIANCE WITH CBC 11B-407.4.9, 11B-308, 11B-703.2, 11B-703.3 AND ASME A17.1.



A ELEVATOR CONTROL PANEL



1. CALL BUTTONS SHALL COMPLY WITH CBC 11B-407.2.1 AND 11B-309.4.

2. CALL BUTTONS SHALL BE LOCATED WITHIN ONE OF THE REACH RANGES SPECIFIED IN CBC 11B-308, MEASURED TO CENTERLINE OF HIGHEST OPERABLE PART IN COMPLIANCE WITH CBC 11B-407.2.1.1.

3. CALL BUTTONS SHALL HAVE SQUARE SHOULDERS, BE 3/4" MINIMUM IN SMALLEST DIMENSION, AND BE RAISED 1/8" PLUS OR MINUS 1/32" ABOVE THE SURROUNDING SURFACE, AND SHALL BE ACTIVATED BY A MECHANICAL MOTION THAT IS DETECTABLE IN COMPLIANCE WITH CBC 11B-407.2.1.2.

4. CALL BUTTONS SHALL BE ARRANGED SUCH THAT THE CALL BUTTON THAT DESIGNATES THE UP DIRECTION SHALL BE LOCATED ABOVE THE CALL BUTTON THAT DESIGNATES THE DOWN DIRECTION IN COMPLIANCE WITH 11B-407.2.1.4.

5. CALL BUTTONS SHALL HAVE VISIBLE SIGNALS THAT WILL ACTIVATE WHEN EACH CALL IS REGISTERED AND WILL EXTINGUISH WHEN EACH CALL IS ANSWERED. CALL BUTTONS SHALL BE INTERNALLY ILLUMINATED WITH A WHITE LIGHT OVER THE ENTIRE SURFACE OF THE BUTTON IN COMPLIANCE WITH CBC 11B-407.2.1.5.

6. HALL SIGNALS, INCLUDING IN-CAR SIGNALS SHALL BE PROVIDED IN COMPLIANCE WITH 11B-407.2.2. VISIBLE AND AUDIBLE SIGNALS SHALL BE PROVIDED AT EACH HOISTWAY ENTRANCE TO INDICATE WHICH CAR IS ANSWERING A CALL AND THE CAR'S DIRECTION OF TRAVEL. WHERE IN-CAR SIGNALS ARE PROVIDED, THEY SHALL BE VISIBLE FROM THE FLOOR AREA ADJACENT TO THE HALL CALL BUTTONS IN COMPLIANCE WITH CBC 11B-407.2.2.1.

THE VISIBLE SIGNAL FIXTURES SHALL BE CENTERED AT 72" MINIMUM ABOVE FINISHED FLOOR OR GROUND, SHALL BE A MINIMUM 2-1/2" HIGH BY 2-1/2" WIDE, AND SHALL BE VISIBLE FROM THE FLOOR AREA ADJANCE TO THE HALL CALL BUTTON IN COMPLIANCE WITH CBC 11B-407.2.2.2.

THE AUDIBLE SIGNALS SHALL SOUND ONCE FOR THE UP DIRECTION AND TWICE FOR THE DOWN DIRECTION, OR SHALL HAVE VERBAL ANNUNCIATIONS THAT INDICATE THE DIRECTION OF ELEVATOR CAR TRAVEL. AUDIBLE SIGNALS SHALL HAVE A FREQUENCY OF 1500 Hz MAXIMUM. VERBAL ANNUNCIATORS SHALL HAVE A FREQUENCY OF 300 Hz MINIMUM AND 3000 Hz MAXIMUM. THE AUDIBLE AND VERBAL ANNUNCIATOR SHALL BE 10 dB MINIMUM ABOVE AMBIENT, BUT SHALL NOT EXCEED 80 dB, MEASURED AT THE HALL CALL BUTTON.

B HOISTWAY AND ELEVATOR ENTRANCES

12 ELEVATOR DETAILS
1/2" = 1'-0"

11/7/2024 3:19:01 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

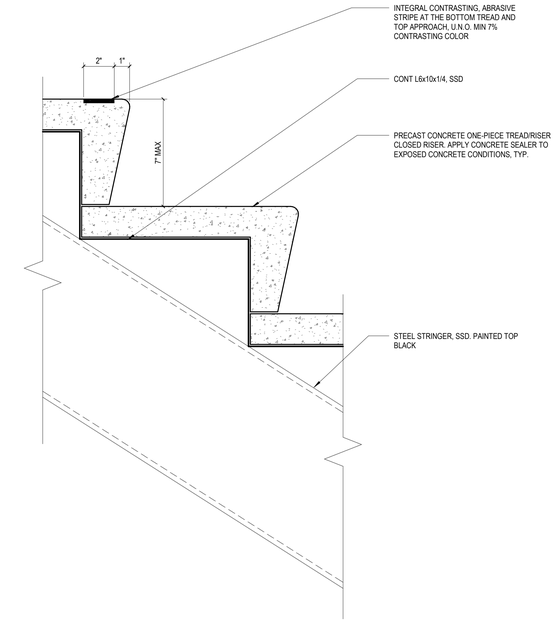
SHEET TITLE:

ELEVATOR DETAILS

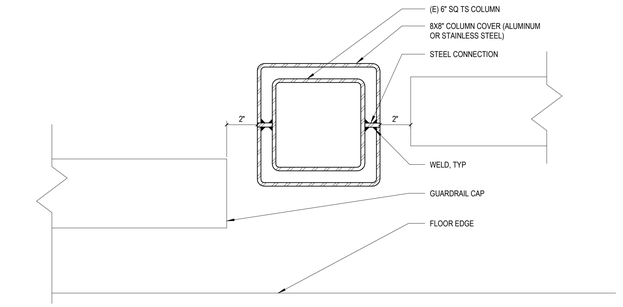
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

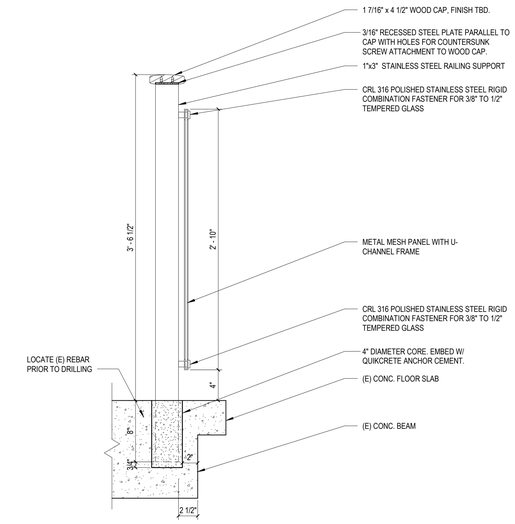
A455



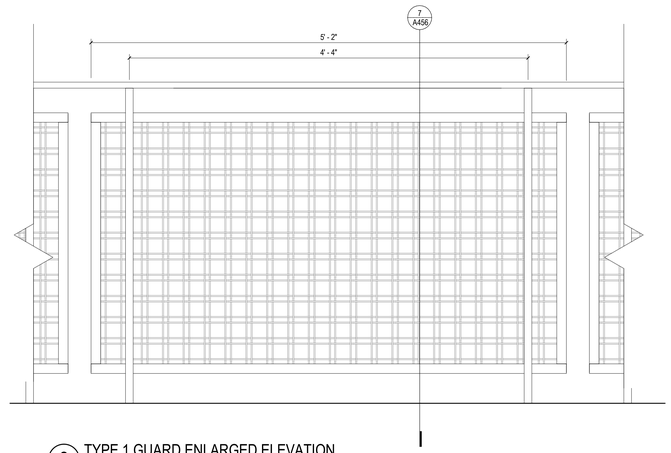
14 STAIR SECTION DETAIL
3" = 1'-0"



5 COLUMN WRAP CONNECTION
3" = 1'-0"



7 RAILING AT LOBBY
1 1/2" = 1'-0"



8 TYPE 1 GUARD ENLARGED ELEVATION
1 1/2" = 1'-0"

11/7/2024 3:19:03 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

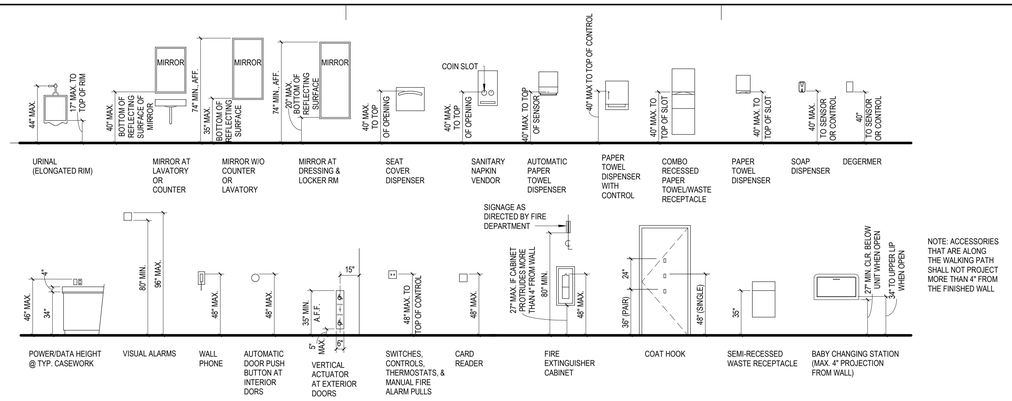
SHEET TITLE:

STAIR & RAILING DETAILS

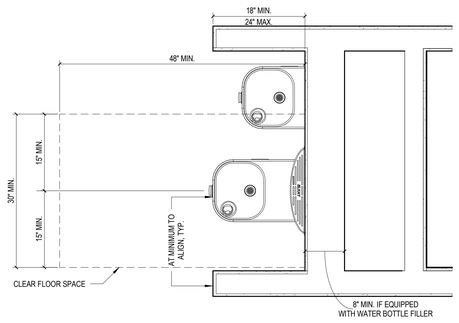
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

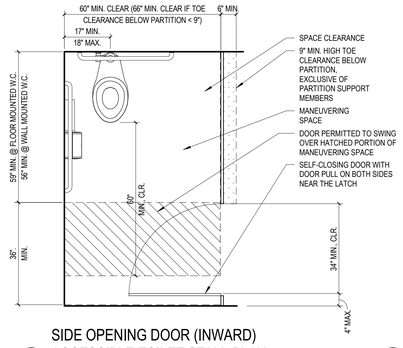
A456



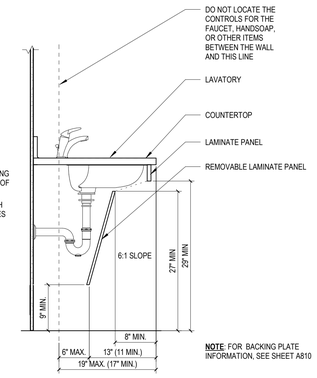
9 ACCESSIBLE MOUNTING HEIGHTS
1/4" = 1'-0"



14 DRINKING FOUNTAIN PLAN
1" = 1'-0"

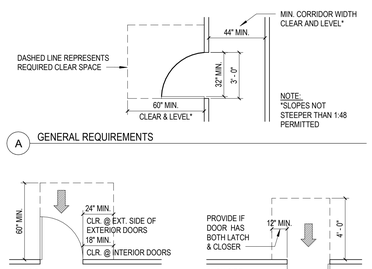


SIDE OPENING DOOR (INWARD)
6 ACCESSIBLE TOILET STALL PLAN
1/2" = 1'-0"

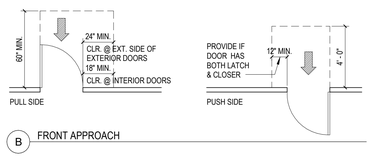


NOTE: FOR BACKING PLATE INFORMATION, SEE SHEET A810

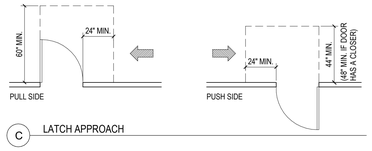
2 COUNTER MOUNTED LAVATORY
1" = 1'-0"



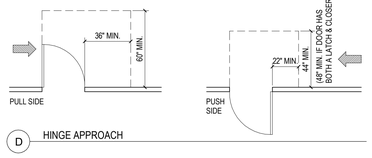
A GENERAL REQUIREMENTS



B FRONT APPROACH

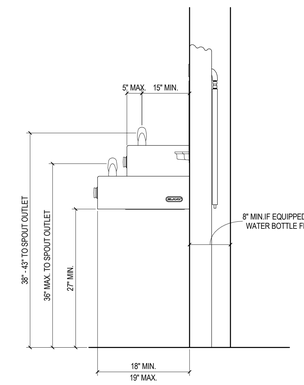


C LATCH APPROACH

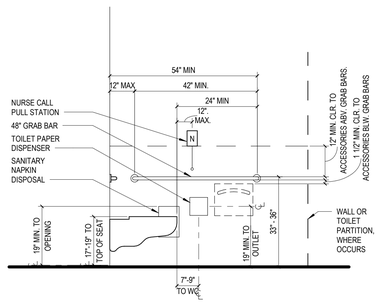


D HINGE APPROACH

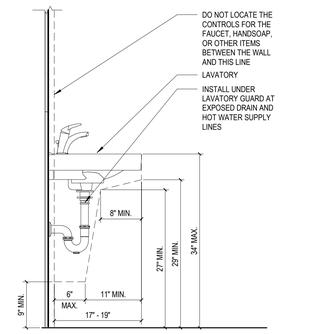
20 ACCESSIBLE DOOR CLEARANCES
1/4" = 1'-0"



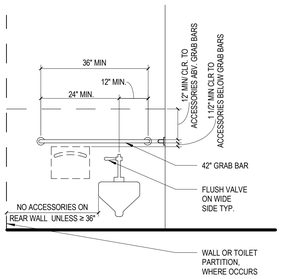
11 DRINKING FOUNTAIN ELEVATION1
1" = 1'-0"



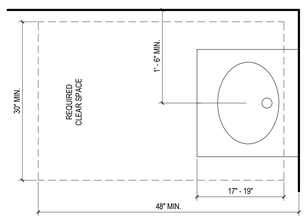
7 ACCESSIBLE TOILET SIDE ELEVATION
1/2" = 1'-0"



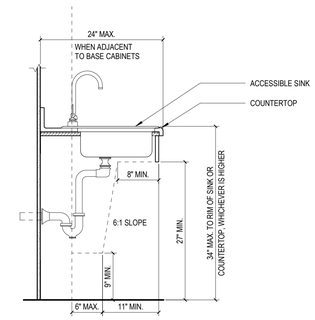
3 WALL MOUNTED ACCESSIBLE LAVATORY1
1" = 1'-0"



12 ACCESSIBLE TOILET REAR ELEVATION
1/2" = 1'-0"



8 ACCESSIBLE LAVATORY PLAN
1" = 1'-0"



4 TYPICAL ACCESSIBLE SINK CABINET
1" = 1'-0"

11/7/2024 3:19:05 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024

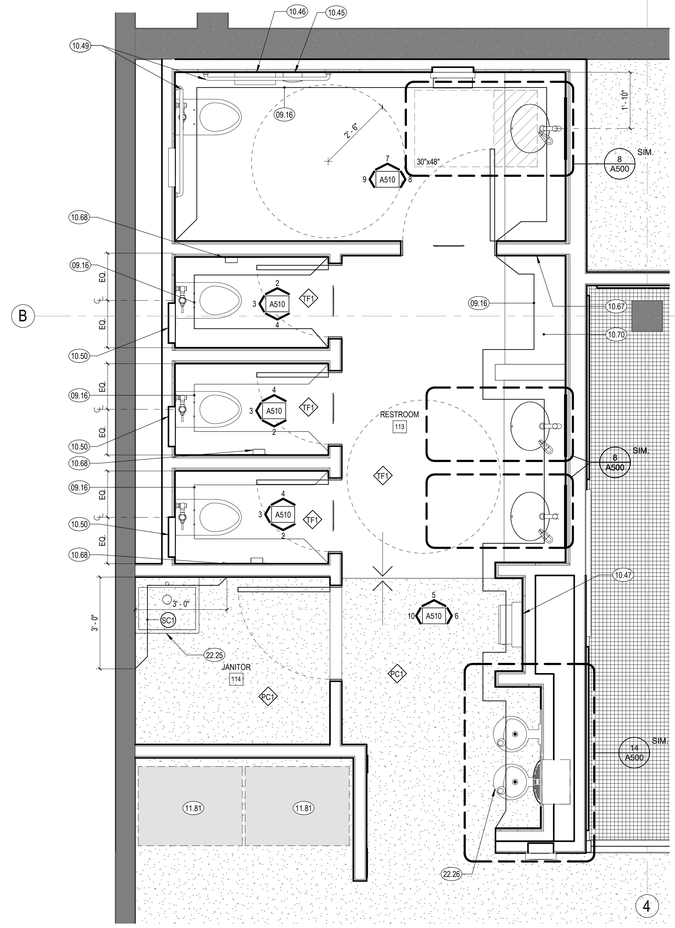
SHEET TITLE:

ACCESSIBILITY DETAILS AND MOUNTING HEIGHTS

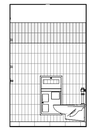
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

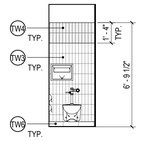
A500



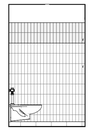
1 ENLARGED RR PLAN - LOWER LEVEL
1/2" = 1'-0"



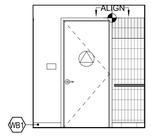
2 TOILET ROOM - S
1/4" = 1'-0"



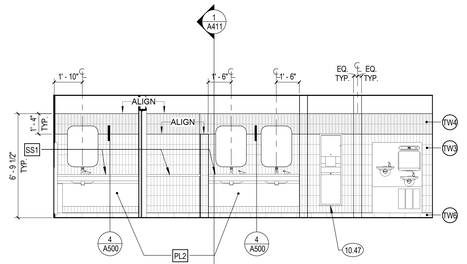
3 TOILET ROOM - W
1/4" = 1'-0"



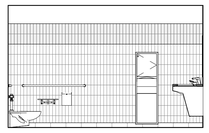
4 TOILET ROOM - N
1/4" = 1'-0"



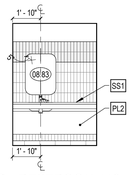
5 RESTROOM 113 - N2
1/4" = 1'-0"



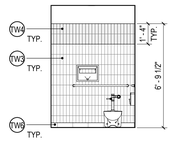
6 RESTROOM 113 - E2
1/4" = 1'-0"



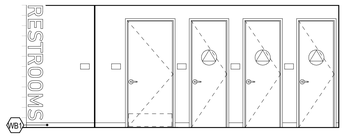
7 RESTROOM 113 - ACCESSIBLE TOILET N
1/4" = 1'-0"



8 RESTROOM 113 - ACCESSIBLE TOILET E
1/4" = 1'-0"



9 RESTROOM 113 - ACCESSIBLE TOILET W
1/4" = 1'-0"



10 RESTROOM 113 - W2
1/4" = 1'-0"

SHEET NOTES

A. FOR PLUMBING FIXTURES, SPD.
B. FOR ADDITIONAL INFORMATION ON FINISHES, SEE SHEETS A230, A231, AND A240.
C. SEE SHEET A500 FOR MOUNTING HEIGHTS AND ACCESSIBLE DIMENSIONS FOR ALL RESTROOM FIXTURES AND ACCESSORIES.

KEYNOTES

08.83	FRAMELESS BEVELED MIRROR WITH ROUNDED CORNERS
09.16	WALL TILE, SEE ELEVATIONS FOR TYPE
10.45	SURFACE MOUNT SANITARY NAPKIN DISPOSAL
10.46	SURFACE MOUNT TOILET PAPER DISPENSER
10.47	SEMI RECESSED COMBINATION PAPER TOWEL AND WASTE RECEPTACLE
10.49	GRAB BAR; 42" MIN AT REAR WALL & 48" MIN AT SIDE WALL
10.50	SEAT COVER DISPENSER
10.67	COAT HOOK
10.68	RECESSED COMBINED TOILET PAPER DISPENSER, SEAT COVER DISPENSER, NAPKIN DISPOSAL
10.70	DIAPER CHANGING STATION
11.81	VENDING MACHINE, OFOI.
22.25	MOP SINK
22.26	DRINKING FOUNTAIN WITH WATER BOTTLE FILLER, SPD

LEGEND

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

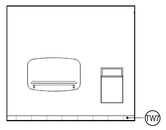
ENLARGED TOILET ROOM PLANS AND ELEVATIONS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A510

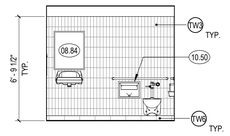
11/7/2024 3:19:14 PM



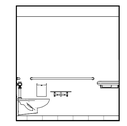
2 FAMILY RESTROOM 308
1/4" = 1'-0"



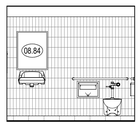
3 FAMILY RESTROOM 308
1/4" = 1'-0"



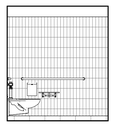
4 FAMILY RESTROOM 308
1/4" = 1'-0"



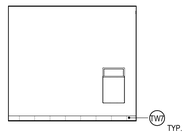
5 FAMILY RESTROOM 308
1/4" = 1'-0"



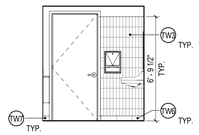
6 RESTROOM 309
1/4" = 1'-0"



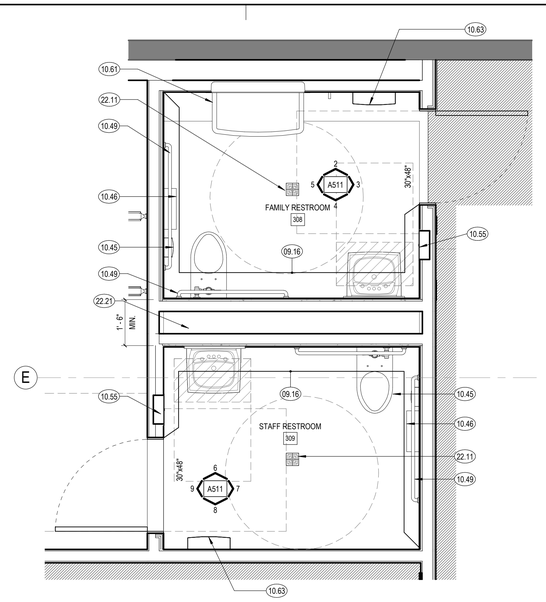
7 RESTROOM 309
1/4" = 1'-0"



8 RESTROOM 309
1/4" = 1'-0"

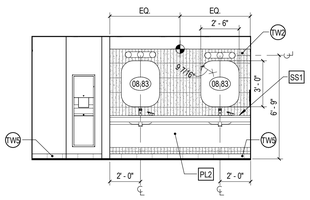


9 RESTROOM 309
1/4" = 1'-0"

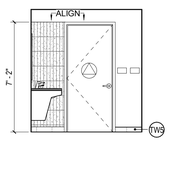


1 MAIN LEVEL - ENLARGED FAMILY AND STAFF RR PLAN
1/2" = 1'-0"

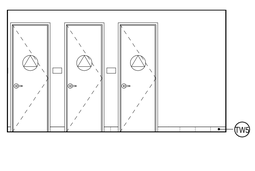
25 RESTROOM 323 - N
1/4" = 1'-0"



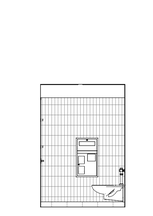
22 RESTROOM 323 - E
1/4" = 1'-0"



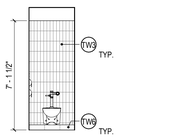
23 RESTROOM 323 - S
1/4" = 1'-0"



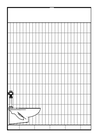
24 RESTROOM 323 - W
1/4" = 1'-0"



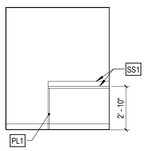
11 TOILET ROOM 320B - N
1/4" = 1'-0"



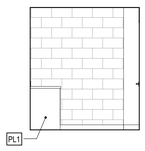
12 TOILET ROOM 320B - W
1/4" = 1'-0"



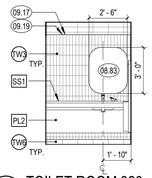
13 TOILET ROOM 320B - S
1/4" = 1'-0"



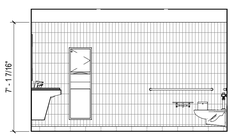
14 LACTATION ROOM - 321 - S
1/4" = 1'-0"



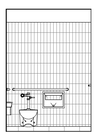
15 LACTATION ROOM - 321 - W
1/4" = 1'-0"



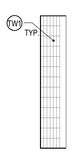
16 TOILET ROOM 320 - E
1/4" = 1'-0"



17 TOILET ROOM 320 - S
1/4" = 1'-0"



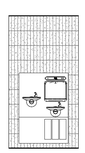
18 TOILET ROOM - 320 - W
1/4" = 1'-0"



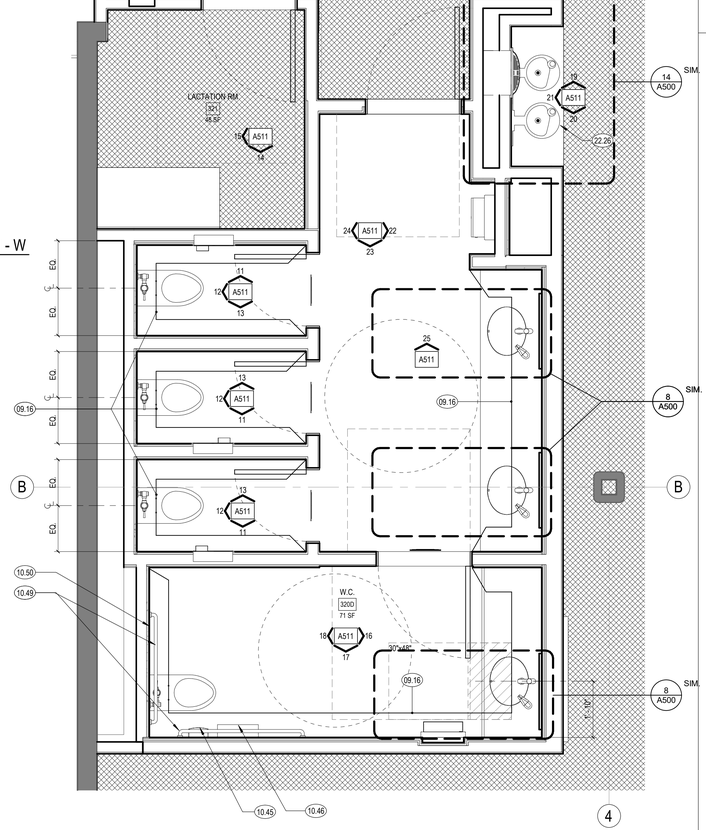
19 DF - N
1/4" = 1'-0"



20 DF - S
1/4" = 1'-0"



21 DF - W
1/4" = 1'-0"



10 ENLARGED RR PLAN - MAIN LEVEL
1/2" = 1'-0"

SHEET NOTES

A. FOR PLUMBING FIXTURES, SPD.
B. FOR ADDITIONAL INFORMATION ON FINISHES, SEE SHEETS A230, A231, AND A240.
C. SEE SHEET A500 FOR MOUNTING HEIGHTS AND ACCESSIBLE DIMENSIONS FOR ALL RESTROOM FIXTURES AND ACCESSORIES.

KEYNOTES

08.83	FRAMELESS BEVELED MIRROR WITH ROUNDED CORNERS
08.84	STAINLESS STEEL WELDED FRAME MIRROR
09.16	WALL TILE, SEE ELEVATIONS FOR TYPE
09.17	METAL TRIM, SEE FINISH SCHEDULE, TYP.
09.19	ALIGN TILE TO TOP OF DOOR, TYP.
10.45	SURFACE MOUNT SANITARY NAPKIN DISPOSAL
10.46	SURFACE MOUNT TOILET PAPER DISPENSER
10.49	GRAB BAR, 42" MIN AT REAR WALL & 48" MIN AT SIDE WALL
10.50	SEAT COVER DISPENSER
10.55	RECESSED PAPER TOWEL DISPENSER
10.61	RECESSED DIAPER CHANGE (OPEN POSITION)
10.63	RECESSED WASTE RECEPTACLE
22.11	FLOOR DRAIN, SPD
22.21	TOILET, SPD
22.26	DRINKING FOUNTAIN WITH WATER BOTTLE FILLER, SPD

LEGEND

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

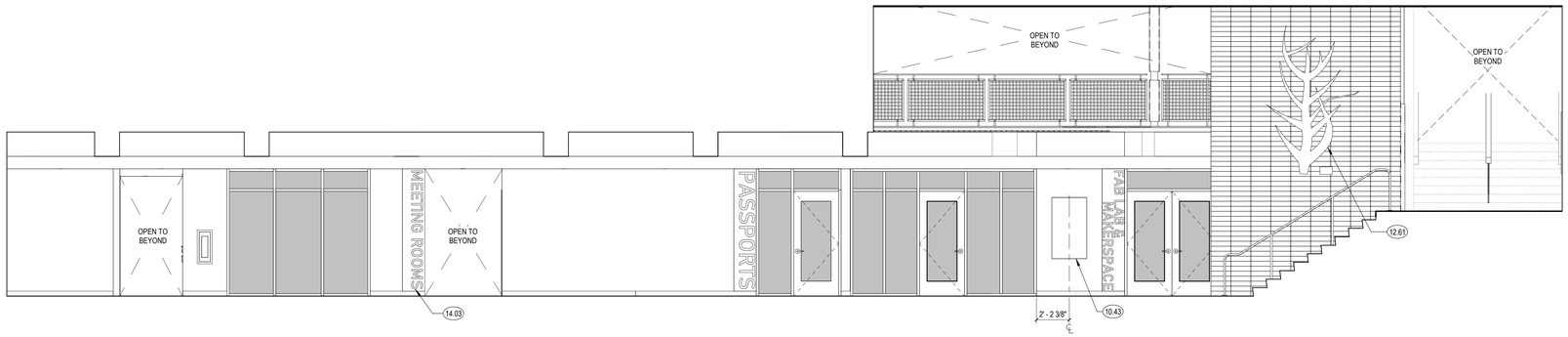
ENLARGED TOILET ROOM PLANS AND ELEVATIONS

SCALE: As indicated

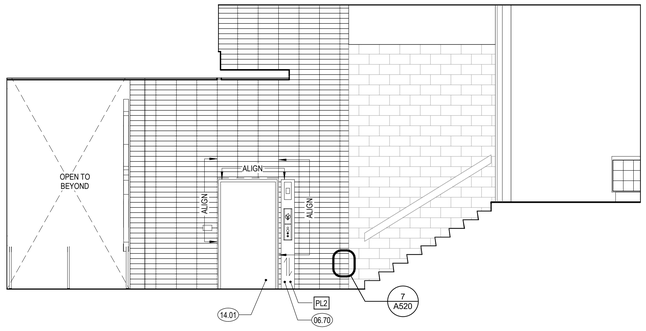
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A511

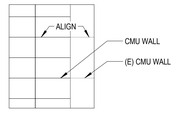
11/7/2024 3:19:26 PM



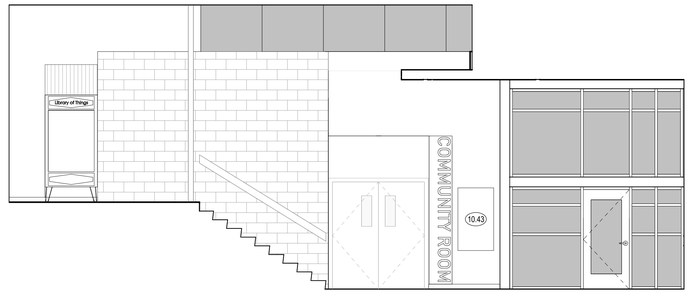
1 LOWER LEVEL - LOBBY 100 - N
1/4" = 1'-0"



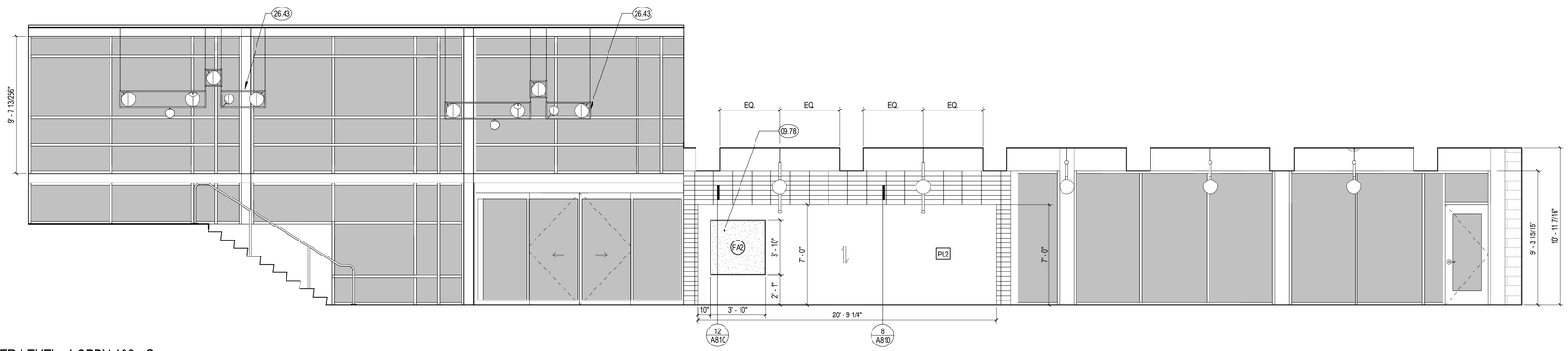
2 MID LEVEL - LOBBY 200 - W
1/4" = 1'-0"



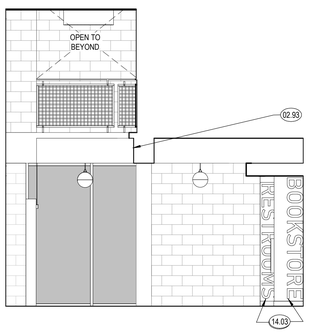
7 MID LEVEL - CMU WALL ALIGNMENT WITH (E) CMU
1" = 1'-0"



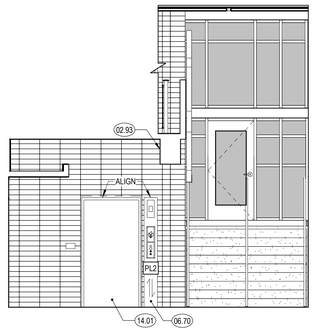
3 MID LEVEL - LOBBY 200 - E
1/4" = 1'-0"



4 LOWER LEVEL - LOBBY 100 - S
1/4" = 1'-0"



5 LOWER LEVEL - LOBBY 100 - W
1/4" = 1'-0"



6 LOWER LEVEL - LOBBY 100 - E
1/4" = 1'-0"



8 MAIN LEVEL - LAPTOP CHECKOUT & BOOK DROPOFF
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETAILS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE ____
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

02.93 (E) BEAM
06.70 ELEVATOR CALL BOX OUT. SEE DETAIL 22/A451.
09.78 TACKABLE ACOUSTIC PANEL, 1" THICK, NRC .75 MIN UNO.
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.
10.90 SEE SHEET A854 FOR SIGNAGE DETAILS
12.22 LAPTOP KIOSK, OFOI
12.61 INSTALL SALVAGED (E) OWL SCULPTURE. DIMENSION IN FIELD AND SUBMIT INSTALLATION SHOP DRAWINGS. SEE A161 FOR ADDITIONAL INFORMATION.
14.01 ELEVATOR DOORS
14.03 SEE A252 FOR SIGNAGE
26.43 PENDANT LIGHT FIXTURE, SED.

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT8 WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

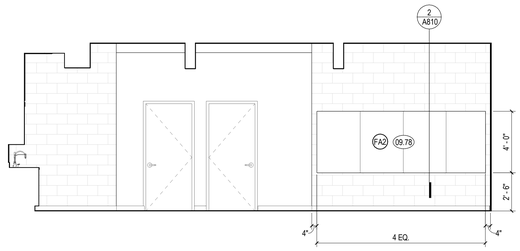
INTERIOR ELEVATIONS

SCALE: As indicated

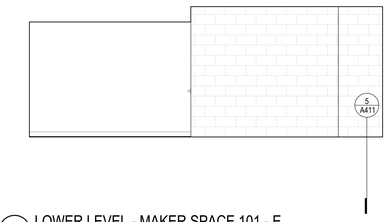
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A520

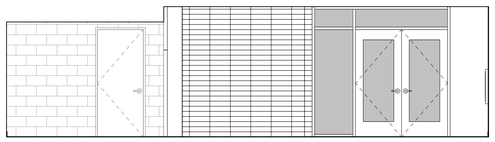
11/7/2024 3:50:03 PM



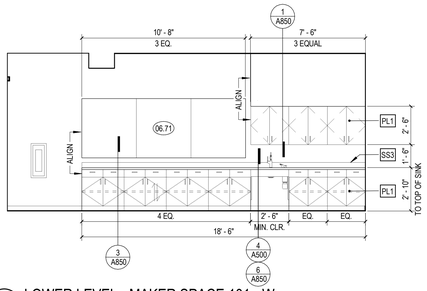
1 LOWER LEVEL - MAKER SPACE 101 - N
1/4" = 1'-0"



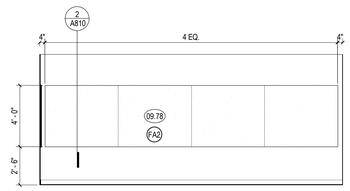
2 LOWER LEVEL - MAKER SPACE 101 - E
1/4" = 1'-0"



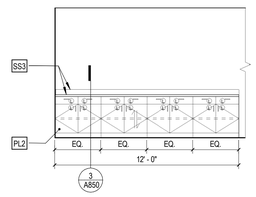
3 LOWER LEVEL - MAKER SPACE 101 - S
1/4" = 1'-0"



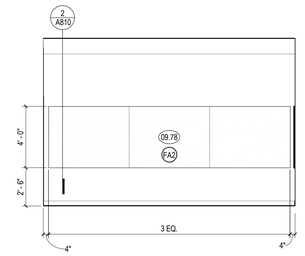
4 LOWER LEVEL - MAKER SPACE 101 - W
1/4" = 1'-0"



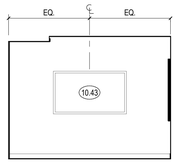
5 LOWER LEVEL - FABRICATION LAB 103 - N
1/4" = 1'-0"



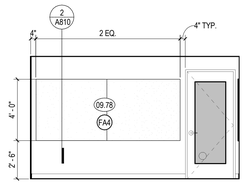
6 LOWER LEVEL - FABRICATION LAB 103 - S
1/4" = 1'-0"



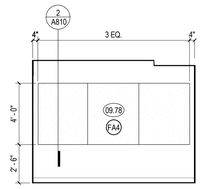
7 LOWER LEVEL - FABRICATION LAB 103 - W
1/4" = 1'-0"



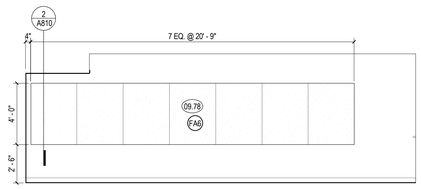
8 LOWER LEVEL - MEETING ROOM 110 - E
1/4" = 1'-0"



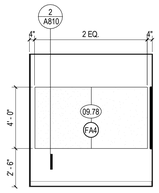
9 LOWER LEVEL - MEETING ROOM 110 - S
1/4" = 1'-0"



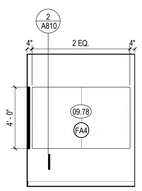
10 LOWER LEVEL - MEETING ROOM 110 - W
1/4" = 1'-0"



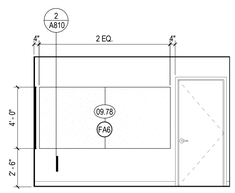
11 LOWER LEVEL - PASS. OFFICE 107 - E
1/4" = 1'-0"



14 LOWER LEVEL - CALL ROOM 109 - N
1/4" = 1'-0"



15 LOWER LEVEL - CALL ROOM 109 - E
1/4" = 1'-0"



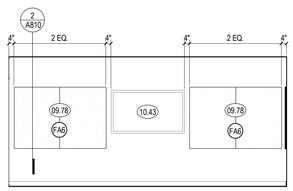
16 LOWER LEVEL - CONFERENCE 111 - N
1/4" = 1'-0"



17 LOWER LEVEL - CONEFRENCE 111 - E
1/4" = 1'-0"



18 LOWER LEVEL - CONFERENCE 111 - S
1/4" = 1'-0"



19 LOWER LEVEL - CONFERENCE 111 - W
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETAILS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE ____
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

06.71 PEGBOARD
09.78 TACKABLE ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT# WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024
SHEET TITLE:

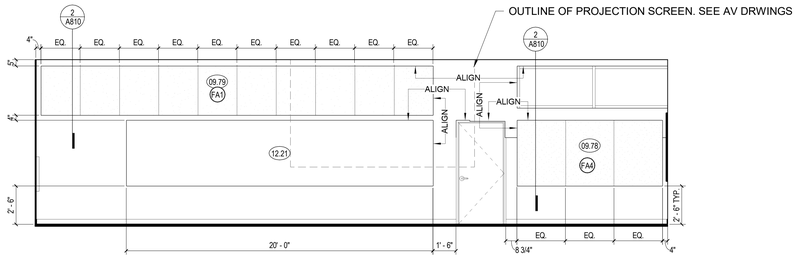
INTERIOR ELEVATIONS

SCALE: As indicated

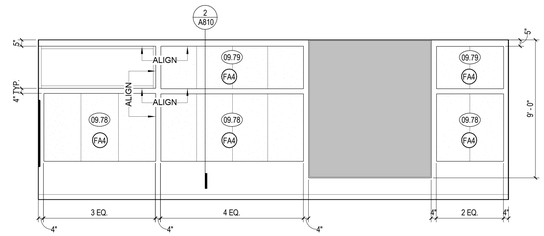
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

A521

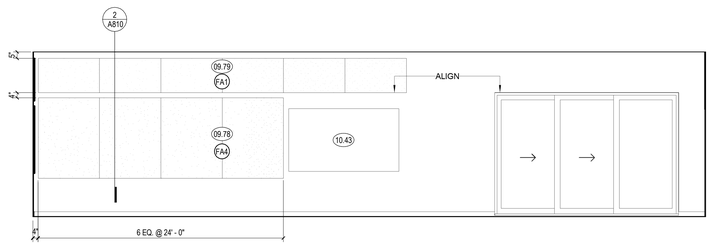
11/7/2024 3:49:03 PM



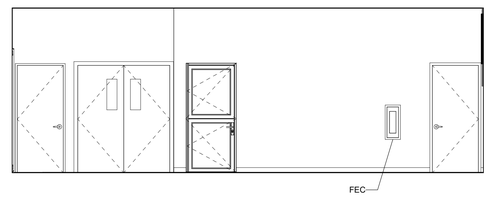
1 MID LEVEL - COMMUNITY ROOM 201 - N
1/4" = 1'-0"



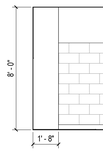
2 MID LEVEL - COMMUNITY ROOM 201 - E
1/4" = 1'-0"



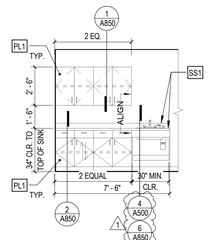
3 MID LEVEL - COMMUNITY ROOM 201 - S
1/4" = 1'-0"



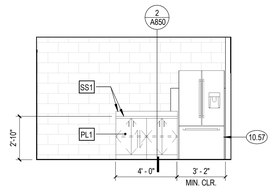
4 MID LEVEL - COMMUNITY ROOM 201 - W
1/4" = 1'-0"



5 MID LEVEL - KITCHEN 202 - N
1/4" = 1'-0"



6 MID LEVEL - KITCHEN 202 - E
1/4" = 1'-0"



8 MID LEVEL - KITCHEN 202 - W
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETAILS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

09.78 TACKABLE ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
09.79 ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
10.43 WALL MOUNTED TV. OFCI. SEE AV DWGS.
10.57 REF. WITH WATER DISPENSER. OFOI
12.21 GLASS MARKERBOARD

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT#
WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

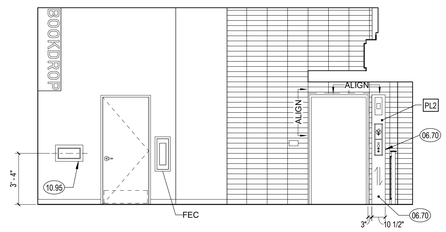
INTERIOR ELEVATIONS

SCALE: As indicated

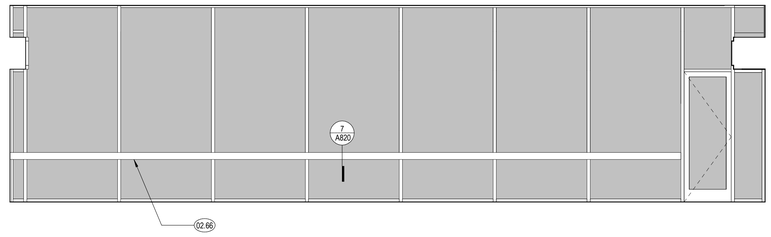
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A522

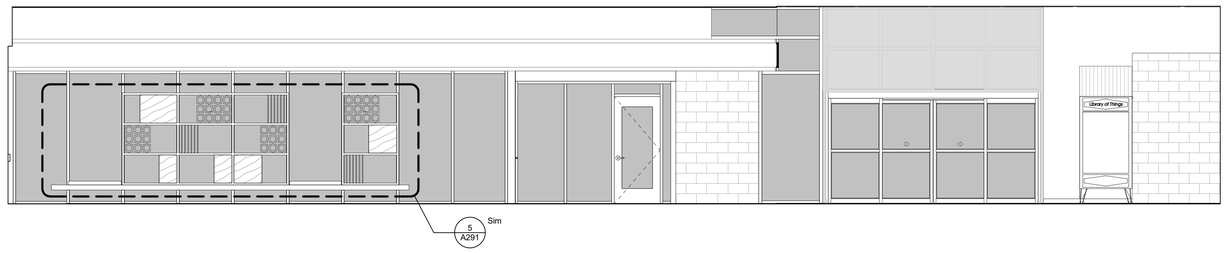
11/7/2024 3:47:20 PM



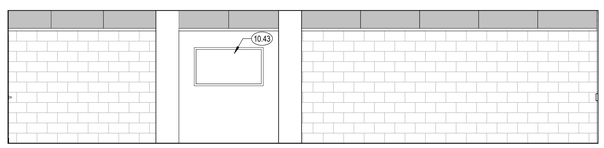
5 MAIN LEVEL - ADULT'S 304 - E
1/4" = 1'-0"



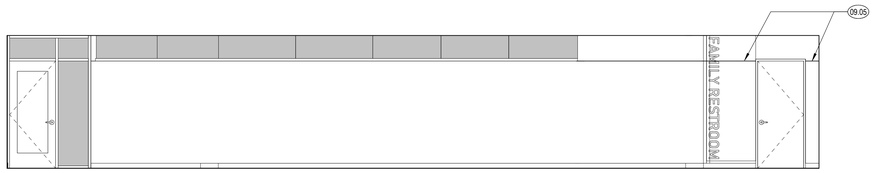
1 MAIN LEVEL - TWEENS 302 - N
1/4" = 1'-0"



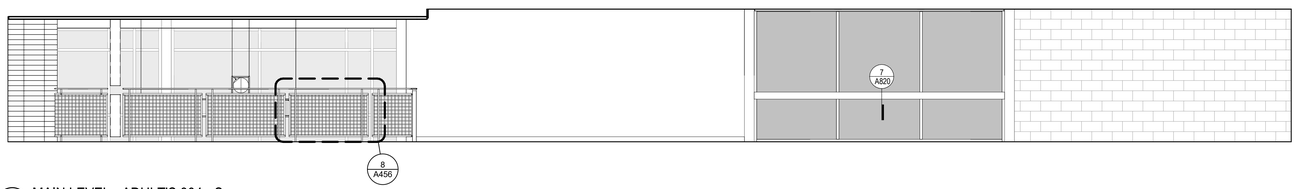
2 MAIN LEVEL - TWEENS 302 - E
1/4" = 1'-0"



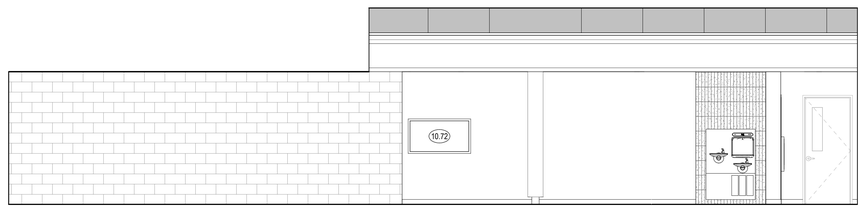
3 MAIN LEVEL - CHILDREN'S 303 - N
1/4" = 1'-0"



4 MAIN LEVEL - CHILDREN'S 303 - W
1/4" = 1'-0"



6 MAIN LEVEL - ADULT'S 304 - S
1/4" = 1'-0"



7 MAIN LEVEL - ADULT'S 304 - W
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETAILS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE ____
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

02.66 REINSTALL SALVAGED CHAIR RAIL
06.70 ELEVATOR CALL BOX OUT. SEE DETAIL 22/A451.
09.05 1/4" REVEAL
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.
10.72 DIGITAL SIGNAGE. SEE AV DWGS
10.95 BOOK DROP OFF

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT# WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024
SHEET TITLE:

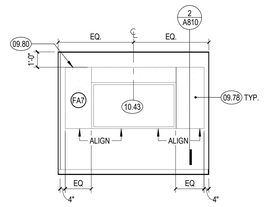
INTERIOR ELEVATIONS

SCALE: As indicated

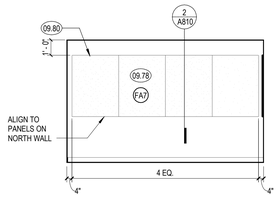
All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A523

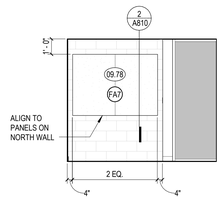
11/7/2024 4:15:01 PM



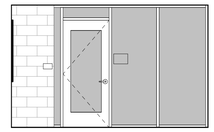
1 MAIN LEVEL - MEETING ROOM 305 - N
1/4" = 1'-0"



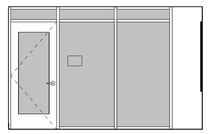
2 MAIN LEVEL - MEETING ROOM 305 - E
1/4" = 1'-0"



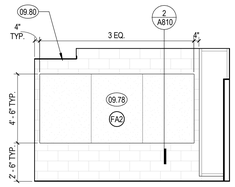
3 MAIN LEVEL - MEETING ROOM 305 - S
1/4" = 1'-0"



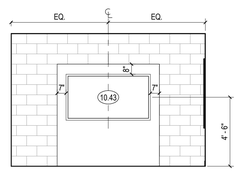
4 MAIN LEVEL - MEETING ROOM 305 - W
1/4" = 1'-0"



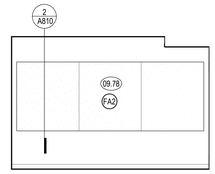
5 MAIN LEVEL - GAMING ROOM 306 - N
1/4" = 1'-0"



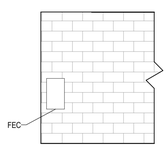
6 MAIN LEVEL - GAMING ROOM 306 - E
1/4" = 1'-0"



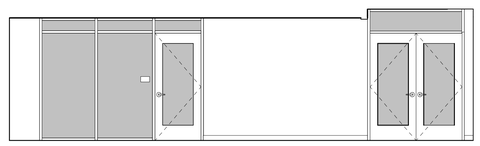
7 MAIN LEVEL - GAMING ROOM 306 - S
1/4" = 1'-0"



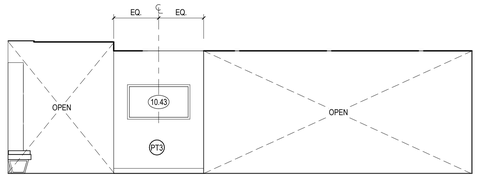
8 MAIN LEVEL - GAMING ROOM 306 - W
1/4" = 1'-0"



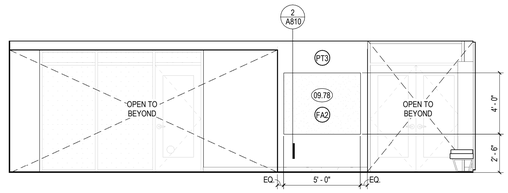
10 MAIN LEVEL - YOUNG ADULTS 307 - E
1/4" = 1'-0"



11 MAIN LEVEL - YOUNG ADULTS 307 - S
1/4" = 1'-0"



12 MAIN LEVEL - YOUNG ADULTS 307 TV WALL - N
1/4" = 1'-0"



13 MAIN LEVEL - YOUNG ADULTS 307 TV WALL - S
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETAILS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE ____
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

09.78 TACKABLE ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
09.80 ALIGN PANEL TO TOP OF DOOR FRAME
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT#
WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

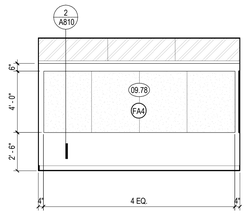
INTERIOR ELEVATIONS

SCALE: As indicated

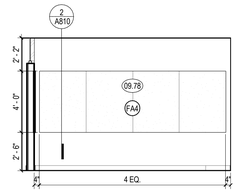
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A524

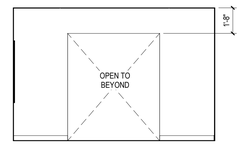
11/7/2024 3:19:57 PM



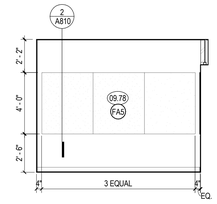
1 MAIN LEVEL - IT/TECH SERVICES 310 - E
1/4" = 1'-0"



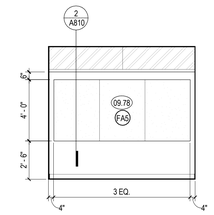
3 MAIN LEVEL - IT/TECH SERVICES 310 - S
1/4" = 1'-0"



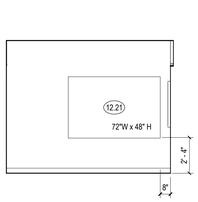
4 MAIN LEVEL - IT/TECH SERVICES 310 - W
1/4" = 1'-0"



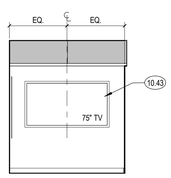
5 MAIN LEVEL - FINANCE OFFICE 311 - N
1/4" = 1'-0"



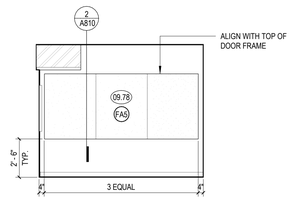
6 MAIN LEVEL - FINANCE OFFICE 311 - E
1/4" = 1'-0"



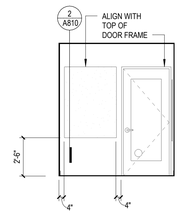
8 MAIN LEVEL - MEETING ROOM 312 - N
1/4" = 1'-0"



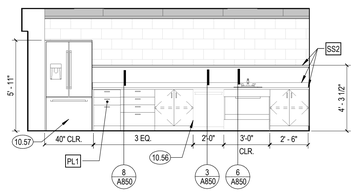
9 MAIN LEVEL - MEETING ROOM 312 - E
1/4" = 1'-0"



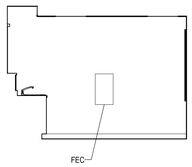
10 MAIN LEVEL - MEETING ROOM 312 - S
1/4" = 1'-0"



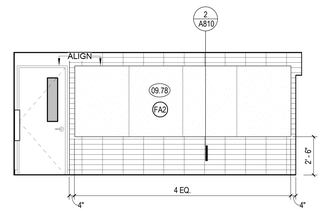
11 MAIN LEVEL - MEETING ROOM 312 - W
1/4" = 1'-0"



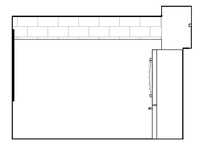
13 MAIN LEVEL - BREAK ROOM 314 - N
1/4" = 1'-0"



14 MAIN LEVEL - BREAK ROOM 314 - E
1/4" = 1'-0"



15 MAIN LEVEL - BREAK ROOM 314 - S
1/4" = 1'-0"



16 MAIN LEVEL - BREAK ROOM 314 - W
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETALS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE _____
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

09.78 TACKABLE ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.
10.56 DISHWASHER. OFOI
10.57 REF. WITH WATER DISPENSER. OFOI
12.21 GLASS MARKERBOARD

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT# WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024
SHEET TITLE:

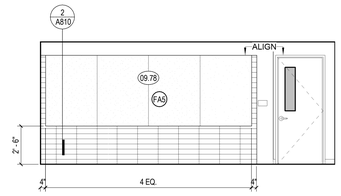
INTERIOR ELEVATIONS

SCALE: As indicated

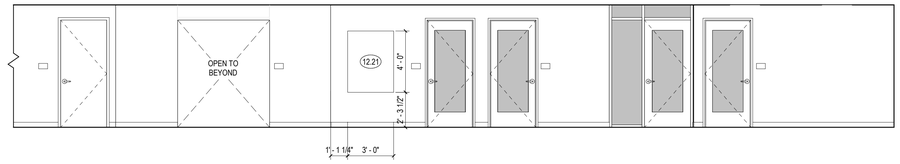
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A525

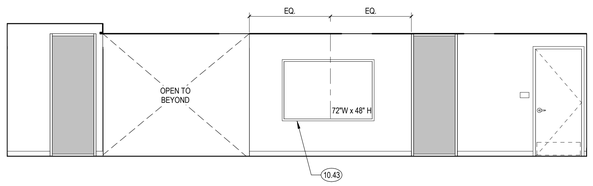
11/7/2024 3:20:04 PM



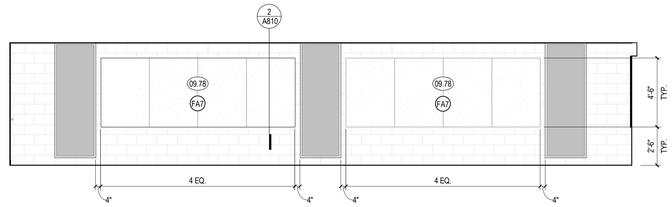
1 MAIN LEVEL - OPEN WORK AREA 315 - N
1/4" = 1'-0"



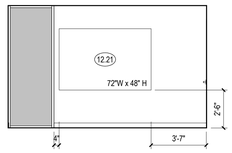
2 MAIN LEVEL - OPEN WORK AREA 315 - E
1/4" = 1'-0"



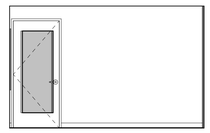
3 MAIN LEVEL - OPEN WORK AREA 315 - S
1/4" = 1'-0"



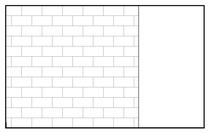
4 MAIN LEVEL - OPEN WORK AREA 315 - W
1/4" = 1'-0"



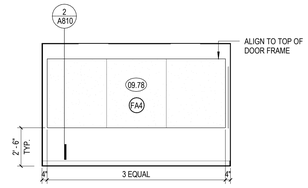
5 MAIN LEVEL - DIR. OFFICE 317 - N
1/4" = 1'-0"



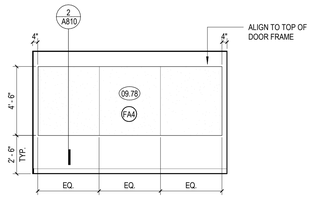
6 MAIN LEVEL - DIR. OFFICE 317 - E
1/4" = 1'-0"



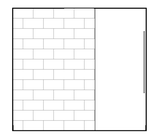
7 MAIN LEVEL - DIR. OFFICE 317 - S
1/4" = 1'-0"



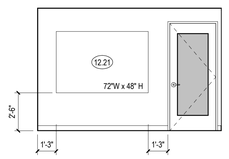
8 MAIN LEVEL - DIR. OFFICE 317 - W
1/4" = 1'-0"



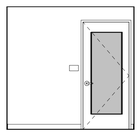
10 MAIN LEVEL - ASST. DIR. OFF. 318 - E
1/4" = 1'-0"



11 MAIN LEVEL - ASST. DIR. OFF. 318 - S
1/4" = 1'-0"



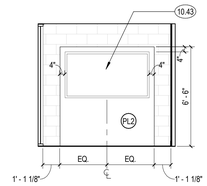
12 MAIN LEVEL - ASST. DIR. OFF. 318 - W
1/4" = 1'-0"



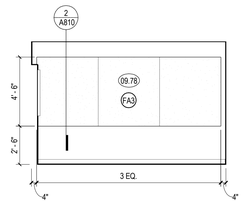
13 MAIN LEVEL - MEETING ROOM 319 - N
1/4" = 1'-0"



14 MAIN LEVEL - MEETING ROOM 319 - E
1/4" = 1'-0"



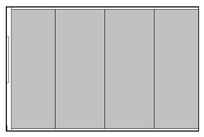
15 MAIN LEVEL - MEETING ROOM 319 - S
1/4" = 1'-0"



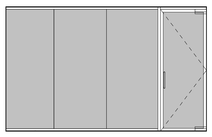
16 MAIN LEVEL - MEETING ROOM 319 - W
1/4" = 1'-0"



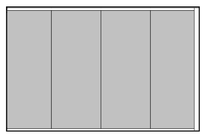
21 ADD ALT. #2 MAIN LEVEL - MTG. ROOM 322
1/4" = 1'-0"



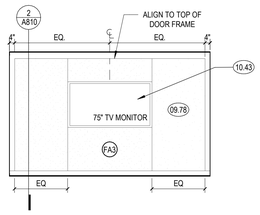
17 ADD ALT. #2 MAIN LEVEL - MTG. ROOM 322 - N
1/4" = 1'-0"



18 ADD ALT. #2 MAIN LEVEL - MTG. ROOM 322 - E
1/4" = 1'-0"



19 ADD ALT. #2 MAIN LEVEL - MTG. ROOM 322 - S
1/4" = 1'-0"



20 ADD ALT. #2 MAIN LEVEL - MTG. ROOM 322 - W
1/4" = 1'-0"

SHEET NOTES

A. SEE SHEET A240 FOR FINISH LEGEND
B. SEE FINISH PLANS FOR FLOOR AND WALL FINISHES
C. SEE SHEET A000 FOR TYPICAL SYMBOLS AND ABBREVIATIONS.
D. FOR INTERIOR DOOR FRONT TYPE SEE A600
E. FOR WINDOW INDENTIFICATION TAG SEE FLOOR PLANS. FOR WINDOW DIMENSIONS AND DETAILS REFER TO WINDOW SCHEDULE SHEETS
F. SEE DETALS IN G130 SHEETS A10.90 FOR TYPICAL MOUNTING HEIGHTS, LOCATIONS, GRAB BAR SIZE AND OTHER ACCESSIBILITY DETAIL
G. ALL ELECTRICAL OUTLETS ABOVE CASEWORK TO BE ORIENTED HORIZONTALLY
H. ELECTRICAL OUTLETS SHOWN FOR REFERENCE. SED FOR LOCATIONS
I. ALL CASEWORK TO BE LOCKABLE U.N.O.
J. FURNTIURE SHOWN FOR REFERENCE ONLY
K. ALL WALL BASE IS RUBBER BASE, WB, AS NOTED IN FINISH LEGEND, UNO
L. FOR FINISH MATERIALS, SEE FINISH LEGEND & INTERIOR FINISH SCHEDULE SHEET A240.
M. ALL GLASS WALL SYSTEMS TO RECEIVE WINDOW FILM WITH CUSTOM FINISH
N. ALL WALLS TO BE PAINTED IN PT1 U.N.O.
O. ALL INTERIOR DOOR AND WINDOW TRIM TO BE PAINTED UNO. SEE DORR SCHEDULE.
P. FOR BACKING DETAILS, REFER TO BACKING PLATE SCHEDULE _____
Q. ALL DIMENSIONS ARE TO FACE OF FINISH UNO., FOR FRAMING DIMENSIONS SEE DIMENSION PLANS

KEYNOTES

09.78 TACKABLE ACOUSTIC PANEL. 1" THICK. NRC .75 MIN UNO.
10.43 WALL MOUNTED TV, OFCI. SEE AV DWGS.
12.21 GLASS MARKERBOARD

LEGEND

GLAZING

EXTENT OF WALL FINISH
WALL FINISH CALL OUT
EXTENT OF WALL FINISH
WT# WALL FINISH CALLOUT

INDICATES TRANSITION OF MATERIAL

INDICATES WOOD GRAIN DIRECTION

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

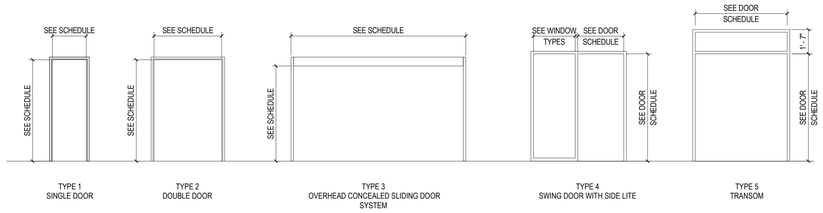
INTERIOR ELEVATIONS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

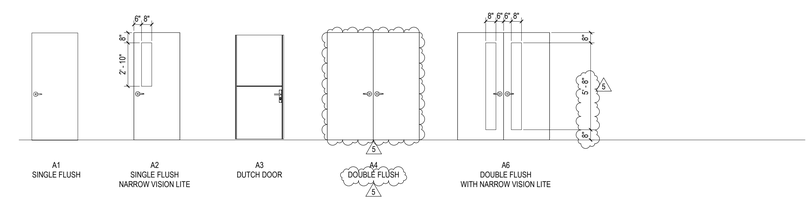
A526

11/7/2024 3:20:12 PM



TYPE 1 SINGLE DOOR | TYPE 2 DOUBLE DOOR | TYPE 3 OVERHEAD CONCEALED SLIDING DOOR SYSTEM | TYPE 4 SWING DOOR WITH SIDE LITE | TYPE 5 TRANSOM

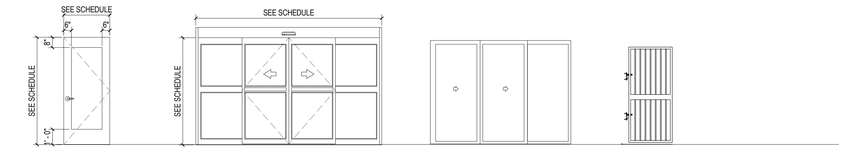
DOOR FRAME TYPES



A1 SINGLE FLUSH | A2 SINGLE FLUSH NARROW VISION LITE | A3 DUTCH DOOR | A4 DOUBLE FLUSH | A6 DOUBLE FLUSH WITH NARROW VISION LITE



CT1 SINGLE FULL LITE LAMINATED GLAZING | CT2 DOUBLE FULL LITE LAMINATED GLAZING



S1 STOREFRONT SINGLE DOOR IGU WITH TEMPERED GLAZING | S3 SLIDING AUTOMATIC ENTRANCE DOORS IGU WITH TEMPERED GLAZING | S4 3 TRACK SLIDING DOOR IGU WITH TEMPERED GLAZING | G1 MTL GATE

DOOR PANEL TYPES



REF #: 1 DOOR: E100 | REF #: 2 DOOR: E102 | REF #: 3 DOOR: E201A



REF #: 4 DOOR: E300 | REF #: 5 DOOR: E301

EXISTING (E) DOORS TO REMIAN REFERENCE PHOTOS

EXISTING (E) TO REMAIN DOOR SCHEDULE

NUMBER	REFERENCE PHOTO NUMBER	DOOR (VERIFY IN FIELD) WIDTH	HEIGHT	MATERIAL	FINISH	FRAME MATERIAL	FRAME FINISH	FIRE RATING	HARDWARE GROUP	PANIC HARDWARE	CLOSER	REMARKS
LOWER LEVEL												
E100	1	3'-0"	6'-8"	HM	PAINT	HM	PAINT			No		PROVIDE CARD READER
E102	2	3'-0"	6'-8"	WD	STAIN	HM	PAINT			Yes	Yes	PROVIDE CARD READER 4
MID-LEVEL												
E201A	3	3'-0"	6'-8"	HM	PAINT	HM	PAINT			Yes		PROVIDE CARD READER. EXISTING PANIC HARDWARE TO REMAIN. 4
MAIN LEVEL												
1 E300	4	10'-0"	13'-0"	MTL		HM			EXISTING TO REMAIN			ROLL-UP DOOR.
E301	5	6'-8" 5	6'-8" 5	ALM		ALM						AUTOMATIC SLIDING DOOR W/ EMERGENCY BREAK-OUT PUSH FUNCTION. PROVIDE CARD READER 4

BASE BID DOOR SCHEDULE

NUMBER	DOOR TYPE	WIDTH	HEIGHT	MATERIAL	FINISH 5	FRAME TYPE	MATERIAL	FINISH	DETAILS HEAD 5	JAMB 5	THRESHOLD 5	FIRE RATING	HARDWARE GROUP	PANIC HARDWARE	CLOSER	REMARKS
LOWER LEVEL																
100A	S3	14' - 6"	7' - 10"	ALM	CLR ANODIZED	-	ALM	CLR ANODIZED	1/A710 SIM	2/A710 SIM			23	Yes	No	AUTOMATIC SLIDING DOOR W/ EMERGENCY BREAK-OUT PUSH FUNCTION. PROVIDE CARD READER
100B	S1	3' - 0"	7' - 0"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED		10/A710 SIM			25	Yes	Yes	CARD READER, PUSH PLATE (EACH SIDE) 5
101	CT2	6' - 0"	7' - 0"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			04			CARD READER
103	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			10			
104	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			19			CARD READER
105	A4	6' - 0"	7' - 0"	WD	STAIN	2	HM	PAINT	1/A820	1/A820			20			CARD READER
106	CT1	3' - 0"	7' - 0"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			05			
107	CT1	3' - 0"	7' - 0"	ALM	CLR ANODIZED	4	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			05			CARD READER
108	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			08			
109	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			09			
110	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			08			
111	CT1	3' - 0"	7' - 0"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			08			
112	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			07			CARD READER
113A	A1	2' - 4"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			14			
113B	A1	2' - 4"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			14			
113C	A1	2' - 4"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			14			
113D	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			13			
114	A1	3' - 0"	7' - 0"	HM	PAINT	1	HM	PAINT	4/A820	4/A820			18			
MID-LEVEL													4			
200	S1	3' - 0"	6' - 8 1/2"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED	1/A710 SIM				21	Yes	Yes	CARD READER & PUSH PLATES (EACH SIDE)
201A	S4	12' - 0"	8' - 0"	ALM	CLR ANODIZED	-	ALM	CLR ANODIZED			7/700		24			
201B	A6	6' - 0"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			27	Yes		CARD READER
202A	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			05			CARD READER
202B	A3	3' - 3 1/4"	7' - 2"	WD 4	STAIN	1	ALM 1	CLR ANODIZED					11			
202G	G1	3' - 0"	7' - 0"	HM	PAINT	1	HM	PAINT						Yes		
203	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			18			CARD READER
215	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			22			CARD READER
MAIN LEVEL																
300A	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			05			CARD READER
302	S1	3' - 0 57/64"	8' - 6"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED					01	Yes		CARD READER & PUSH PLATES (EACH SIDE)
303	A2	3' - 0"	7' - 0"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED					02	Yes	Yes	
305	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			08			
306	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			07			CARD READER
307A	CT2	6' - 0"	7' - 0"	WD	STAIN	5	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			03	No		
308	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			12		Yes	
309	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			12		Yes	
311	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			07			CARD READER
312	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			08	4		
313	A1	3' - 0"	7' - 0"	HM	CLR ANODIZED	1	HM	PAINT	4/A820	4/A820			26	Yes	Yes	CARD READER & PUSH PLATES (EACH SIDE)
314	A2	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			06		Yes	
315	CT1	3' - 0"	7' - 0"	ALM	CLR ANODIZED	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			05			CARD READER
316A	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			05		Yes	CARD READER
317	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			07			CARD READER
318	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			07			CARD READER
319	CT1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	2/A820 SIM	2/A820 SIM			08			
320	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			15			
320A	A1	2' - 4"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			14			
320B	A1	2' - 4"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			14			
320C	A1	2' - 4"	7' - 0"	WD	STAIN	2	ALM	CLR ANODIZED	4/A820	4/A820			14			
320D	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			13			
321	A1	3' - 0"	7' - 0"	WD	STAIN	1	ALM	CLR ANODIZED	4/A820	4/A820			12			

ADD ALTERNATE DOOR SCHEDULE

NUMBER	DOOR TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	FRAME TYPE	MATERIAL	FINISH	FIRE RATING	HARDWARE GROUP	PANIC HARDWARE	CLOSER	REMARKS
302A	S4	15' - 5"	12' - 10 3/4"				ALM						
302B	S4	15' - 5"	12' - 10 3/4"				ALM						
302C	S4	15' - 5"	12' - 10 3/4"				ALM						
322	D1	3' - 0"	7' - 11 3/8"			-	ALM						

SHEET NOTES

GENERAL NOTES:

1. S# DOOR TYPES ARE STOREFRONT ASSEMBLIES, SEE SHEET A610 AND A611 5
2. DOOR OPERATION AND HARDWARE : EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.
3. DOOR HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATIONS DEVICES TO BE ACCESSIBLE BY CHAPTER 11A OR 11B OF THE CALIFORNIA BUILDING CODE - SHALL NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING OR TWISTING OF THE WRIST TO OPERATE.
4. ALL DOORS WITH LATCH TO BE EQUIPPED WITH SINGLE EFFORT NON-GRASP HARDWARE (I.E. LEVER) CENTERED BTWN. 30" AND 44" A.F.F.
5. ALL GLAZED DOORS TO HAVE A 10" KICK PLATE AT BOTTOM .
6. SEE SPECIFICATIONS FOR DOOR HARDWARE GROUP
7. DOOR HARDWARE ARE OPERABLE WITH ONE HAND AND DO NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE HAND. CBC 11B-404.2.7 AND 11B-309.4.
8. DOOR THRESHOLDS, IF PROVIDED AT DOORWAYS, TO BE ½ INCH HIGH MAXIMUM. RAISED THRESHOLDS AND CHANGES IN LEVEL AT DOORWAYS SHALL COMPLY WITH CBC SECTION 11B-302 AND 11B-303. CBC 11B-404.2.5.
9. DOOR OPENING FORCE TO NOT EXCEED 5-POUNDS FOR INTERIOR AND EXTERIOR DOORS PER CBC 11B-404.2.9.
10. DOOR OPENING HARDWARE TO BE MOUNTED AT 34" TO 44" ABOVE THE FINISH FLOOR PER CBC 11B-404.2.7.
11. LOWER 10 INCH OF THE DOOR SURFACE IS PROVIDED WITH A SMOOTH SURFACE FOR THE FULL WIDTH OF THE DOOR, AT THE PUSH SIDE OF THE DOOR PER CBC 11B-404.2.10.

ABBREVIATIONS
ALM: ALUMINUM
HM: HOLLOW METAL
5

REMARKS

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #3 FIRE ENGINEERING SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
4	06/13/2025	FIRE PLAN BACKCHECK
5	07/16/2025	FIRE PLAN BACKCHECK #3

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024

SHEET TITLE:

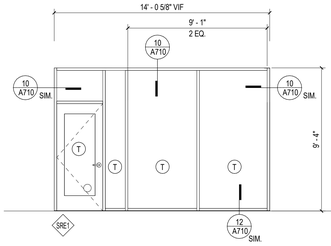
DOOR TYPES, FRAME TYPES, AND SCHEDULES

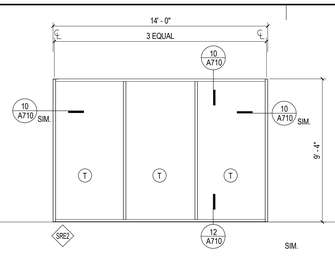
SCALE: As indicated

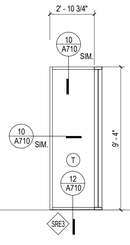
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

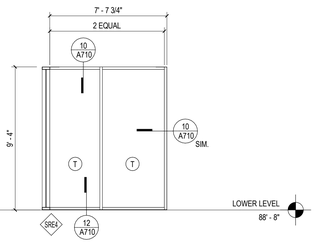
A600

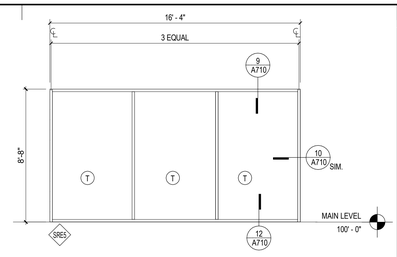
7/16/2025 2:52:18 PM

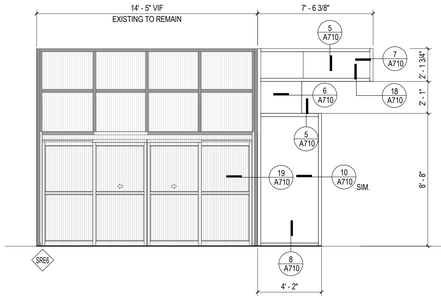


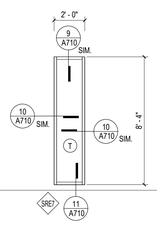


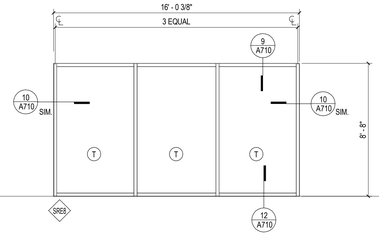


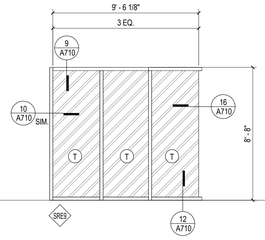


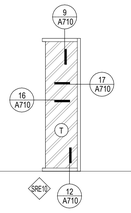


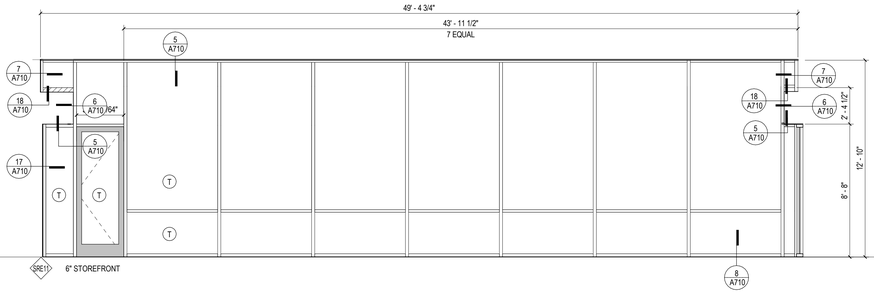


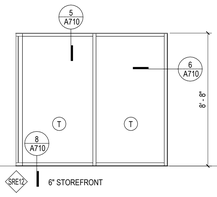


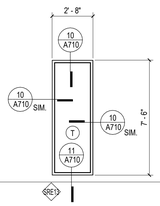


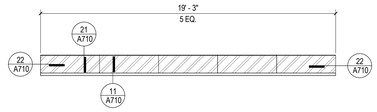


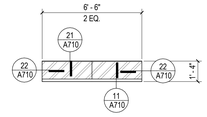


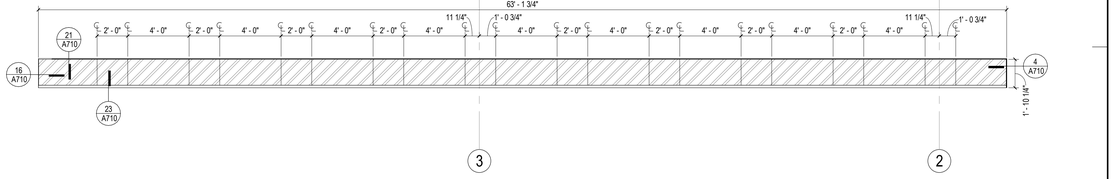


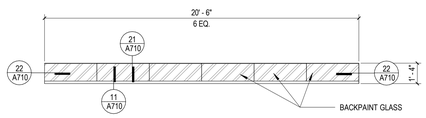


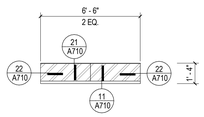


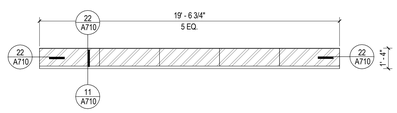












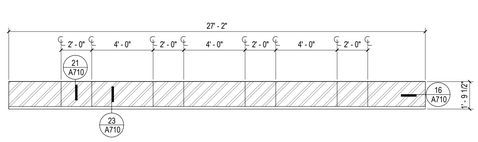
SRE16 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

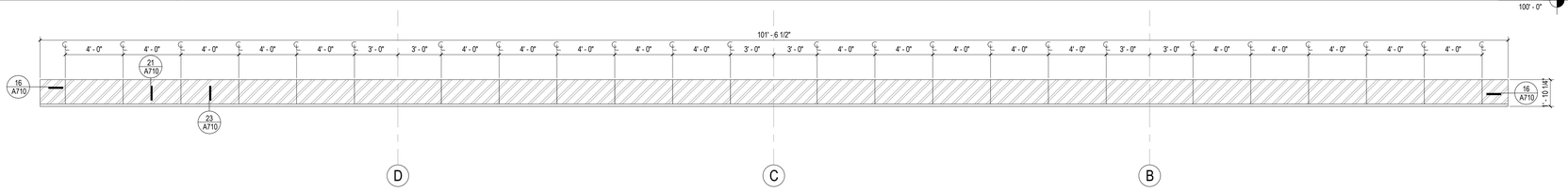
SRE17 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

SRE18 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

SRE19 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

MAIN LEVEL 100' - 0"

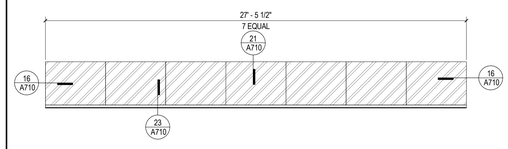


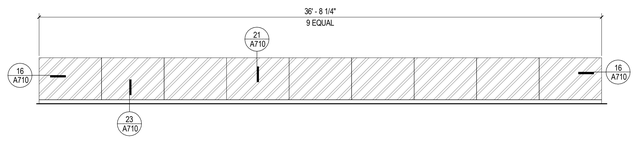


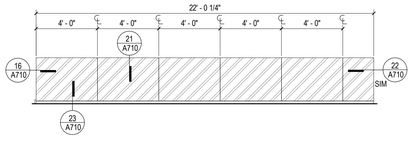
SRE20 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

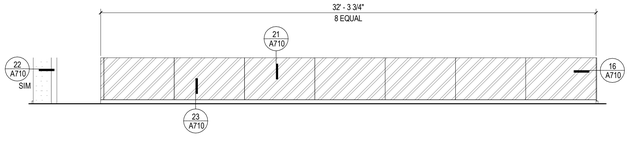
SRE21 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

MAIN LEVEL 100' - 0"









SRE22 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

SRE23 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

SRE24 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

SRE25 STOREFRONT SILL WITH CHANNEL & BUTT JOINT GLAZING

MAIN LEVEL 100' - 0"

SHEET NOTES

A. VERIFY ALL DIMENSIONS IN FIELD FOR SRE # WINDOWS.
B. ALL WINDOWS ARE 2" X 4 1/2" STOREFRONT UNLESS NOTED OTHERWISE
C. SRE# WINDOW FRAMES - FLUROPON METAL TRENDS COATING TO MATCH (E) LIGHT BRONZE ANODIZED FINISH.
D. S# WINDOW FRAMES - DARK BRONZE ANODIZED.

GLAZING LEGEND

- (E) GLAZING SYSTEM
- GL 1 - 1" INSULATED GLAZING
- GL 2 - 1" INSULATED GLAZING W/CERAMIC FRIT PATTERN, SEE 8/A611 & 4/A611
- GL 3 - 1/2" GLAZING

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

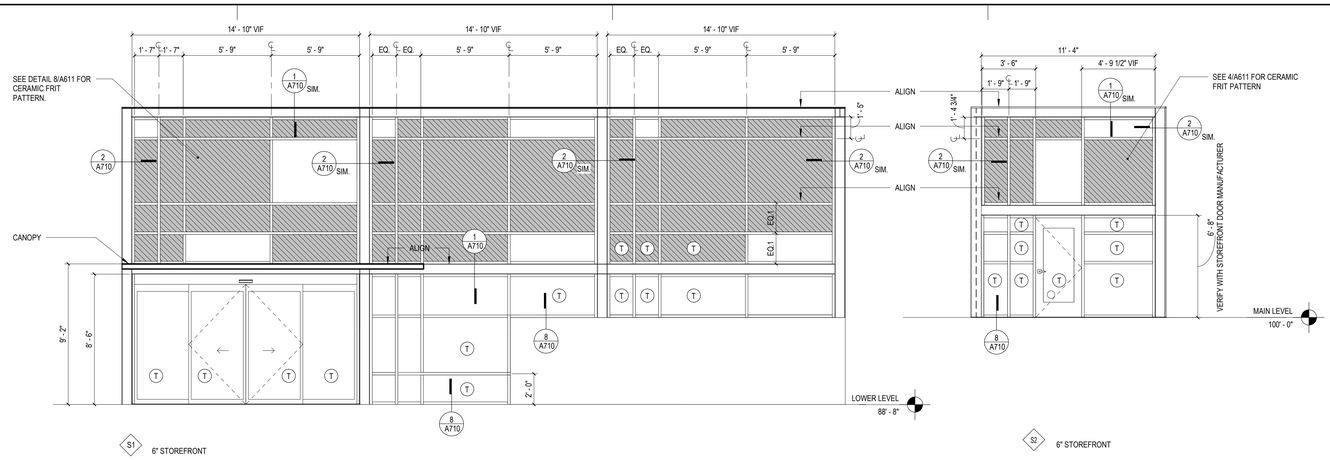
EXTERIOR WINDOW TYPES

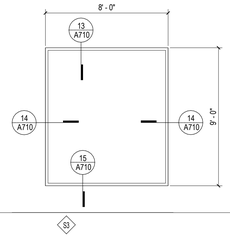
SCALE: As indicated

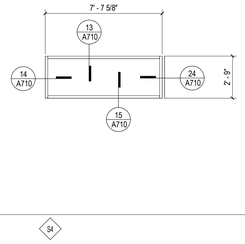
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

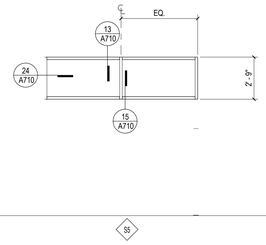
A610

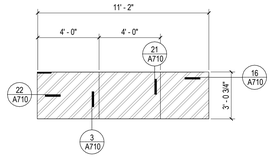
11/7/2024 3:20:25 PM

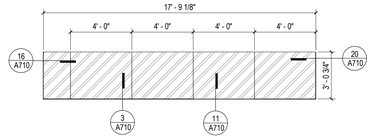


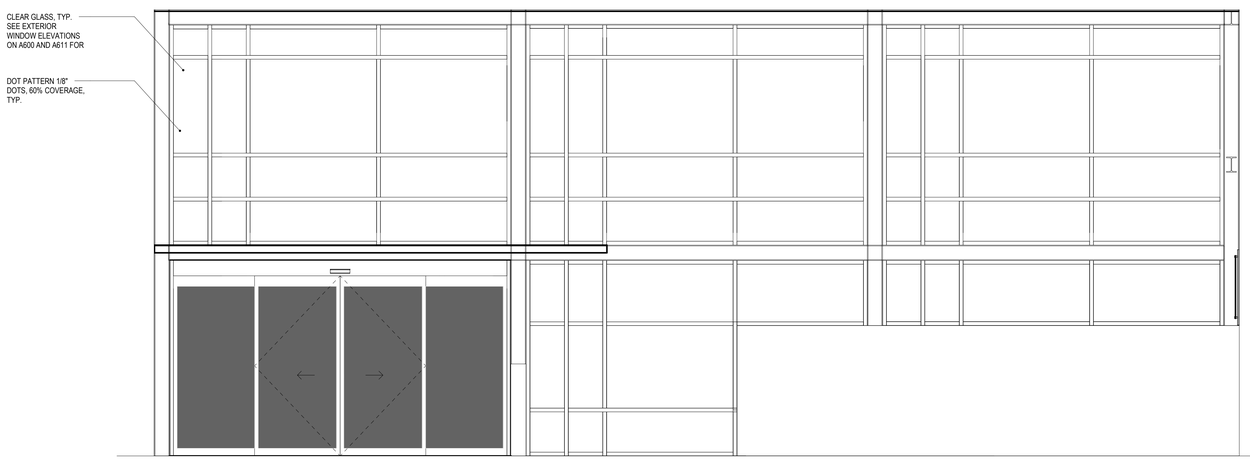




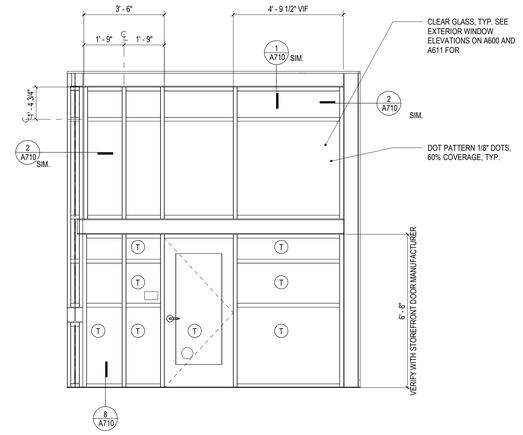








20 SOUTH ENTRY LOBBY FACADE - CERAMIC FRIT PATTERN
3/8" = 1'-0"



8 ENTRY LOBBY FACADE AT DECK - CERAMIC FRIT PATTERN
3/8" = 1'-0"

SHEET NOTES

A. VERIFY ALL DIMENSIONS IN FIELD

B. ALL WINDOWS ARE 2" X 4 1/2" STOREFRONT UNLESS NOTED OTHERWISE

C. SR# WINDOW FRAMES - FLUROPON METAL TRENDS COATING TO MATCH (E) LIGHT BRONZE ANODIZED FINISH.

D. S# WINDOW FRAMES - DARK BRONZE ANODIZED.

GLAZING LEGEND

(E) GLAZING SYSTEM

GL 1 - 1" INSULATED GLAZING

GL 2 - 1" INSULATED GLAZING W/CERAMIC FRIT PATTERN, SEE 8/A611 & 4/A611

GL 3 - 1/2" GLAZING

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

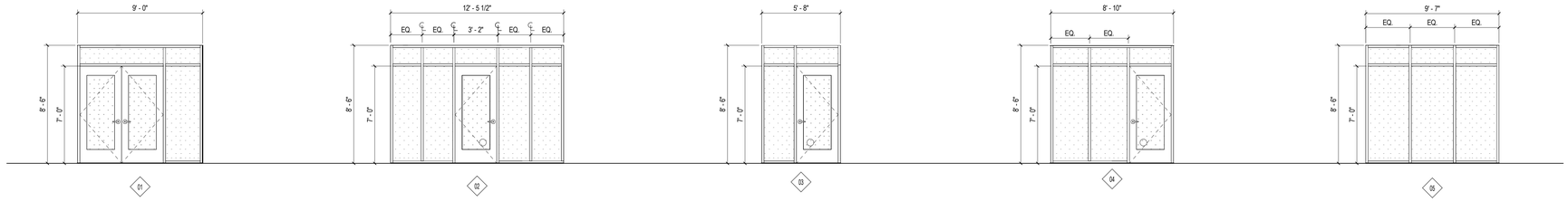
EXTERIOR WINDOW TYPES

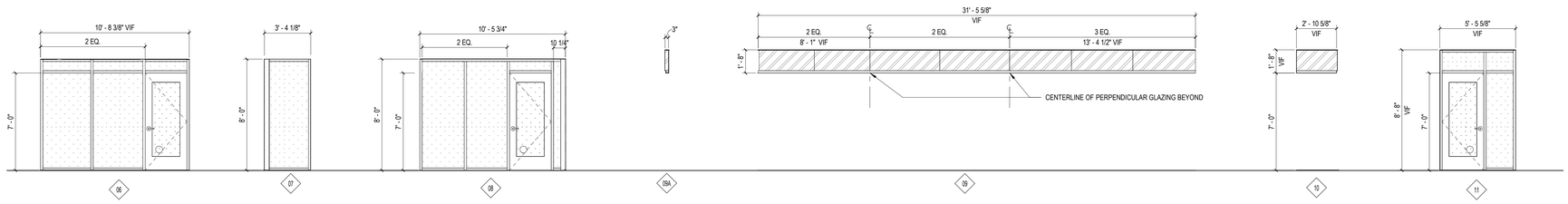
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

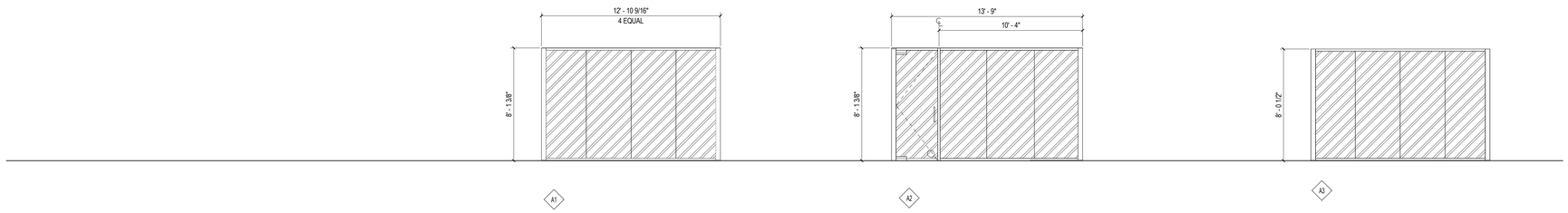
A611

11/7/2024 3:20:35 PM









SHEET NOTES

GLAZING TYPES LEGEND

GL 3 - 1/2" NOMINAL LAMINATED GLAZING

GL 5 - 1/4" NOMINAL LAMINATED GLAZING

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

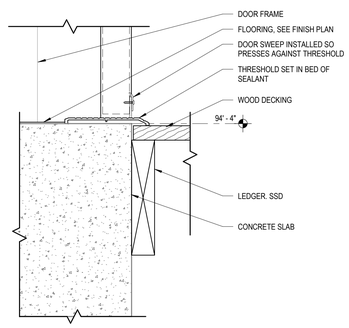
INTERIOR WINDOW TYPES

SCALE: As indicated

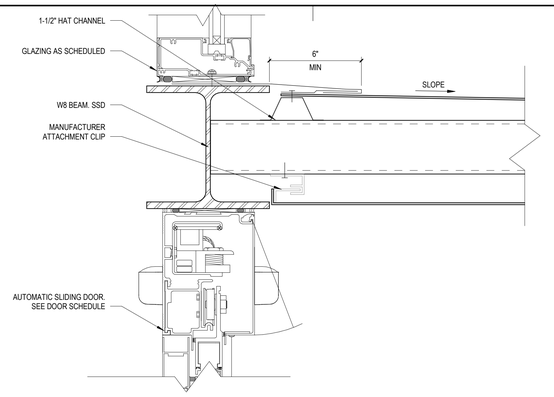
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

A612

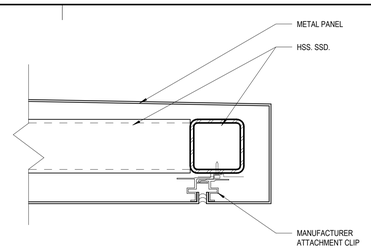
11/7/2024 3:20:35 PM

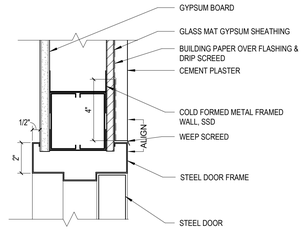


13 SWING DOOR SILL @ DECK
3" = 1'-0"

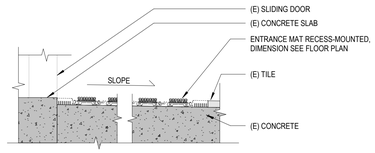


9 CANOPY SECTION @ COLUMN
3" = 1'-0"

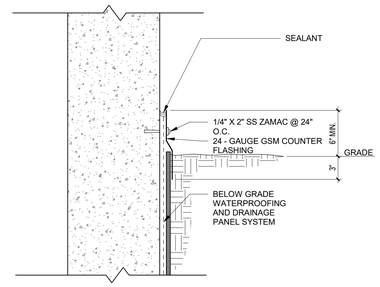




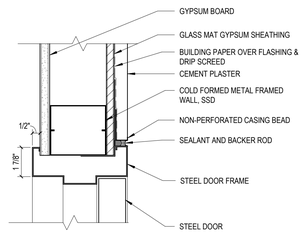
14 EXTERIOR STEEL DOOR HEAD
3" = 1'-0"



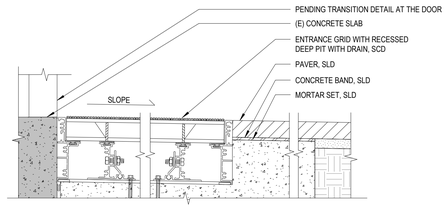
10 RECESSED ENTRANCE MAT
3" = 1'-0"



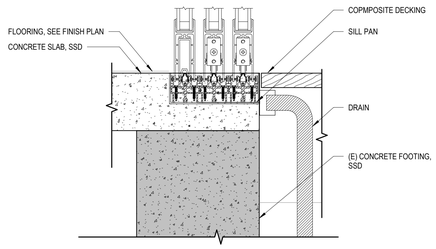
6 WATERPROOFING AT CONCRETE RETAINING WALL
1 1/2" = 1'-0"



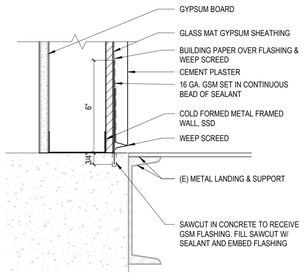
15 EXTERIOR STEEL DOOR JAMB
3" = 1'-0"



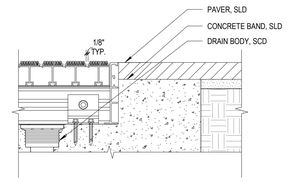
11 RECESSED ENTRANCE GRID
3" = 1'-0"



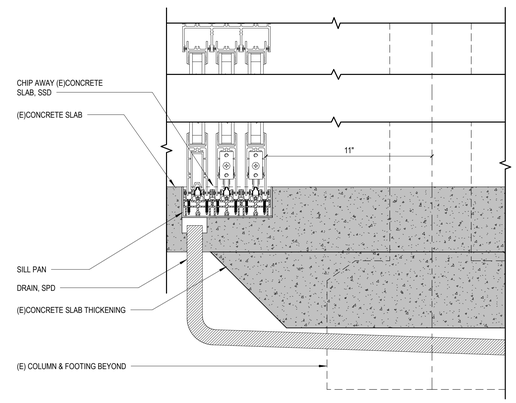
7 SLIDING DOOR SILL @ COMMUNITY ROOM
3" = 1'-0"



16 BASE OF WALL AT CEMENT PLASTER
3" = 1'-0"



12 RECESSED ENTRANCE GRID @ DRAIN
3" = 1'-0"



8 ADD ALT #1 NORTH PATIO SLIDING DOOR SILL
3" = 1'-0"

11/7/2024 3:20:38 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

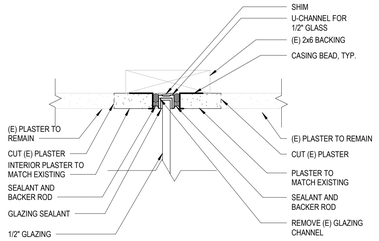
SHEET TITLE:

EXTERIOR DETAILS

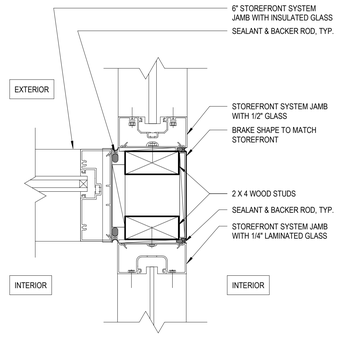
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

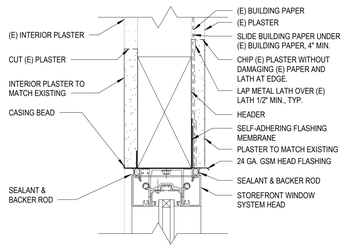
A700



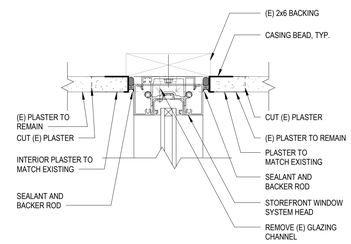
21 CLERESTORY HEAD @ PLASTER
3" = 1'-0"



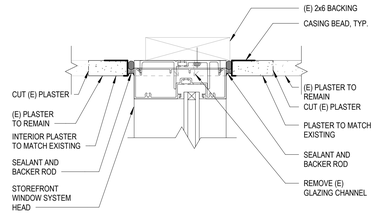
17 EXTERIOR & INTERIOR STOREFRONT JAMB
3" = 1'-0"



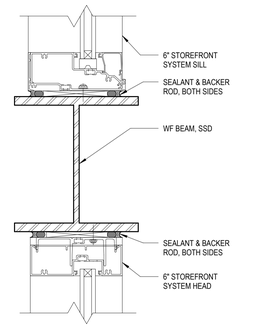
13 STOREFRONT HEAD @ PLASTER WALL
3" = 1'-0"



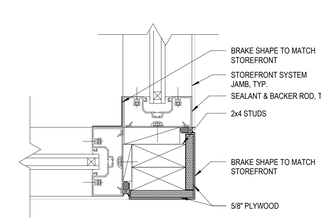
9 STOREFRONT HEAD @ PLASTER SOFFIT
3" = 1'-0"



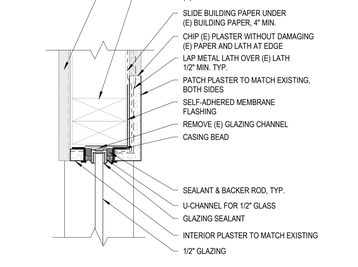
5 6" STOREFRONT HEAD @ PLASTER SOFFIT
3" = 1'-0"



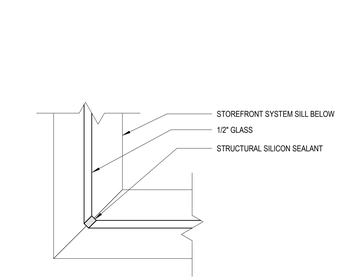
1 6" STOREFRONT HEAD & SILL @ BEAM
3" = 1'-0"



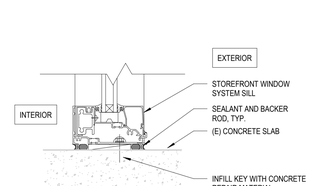
22 CLERESTORY JAMB @ CMU/CONCRETE
3" = 1'-0"



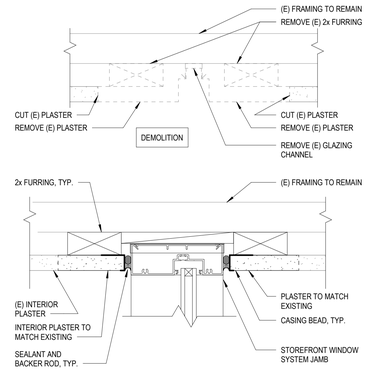
18 6" STOREFRONT SILL @ SOFFIT ROOF
3" = 1'-0"



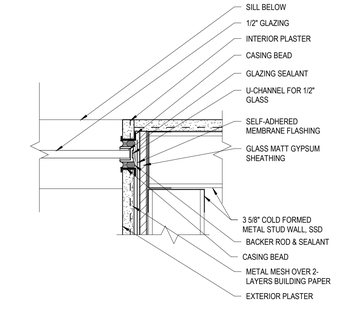
14 STOREFRONT JAMB @ PLASTER WALL
3" = 1'-0"



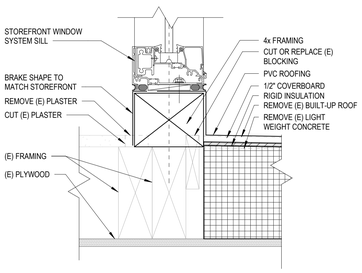
10 STOREFRONT HEAD @ CMU/CONC. (JAMB SIM.)
3" = 1'-0"



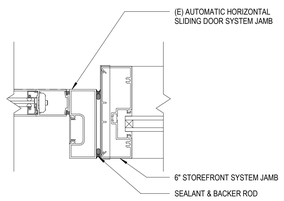
6 6" STOREFRONT JAMB @ FACE OF SOFFIT
3" = 1'-0"



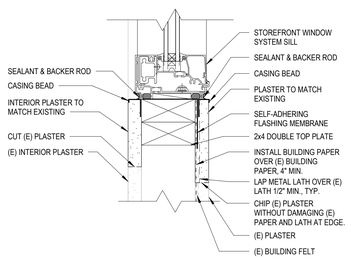
2 6" STOREFRONT JAMB @ COLUMN
3" = 1'-0"



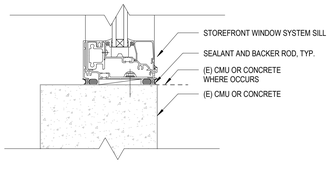
23 CLERESTORY SILL @ LOWER ROOF
3" = 1'-0"



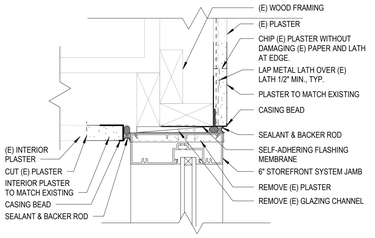
19 6" STOREFRONT JAMB @ (E) SLIDING DOOR
3" = 1'-0"



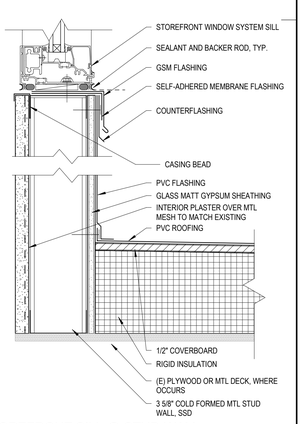
15 STOREFRONT SILL @ PLASTER WALL
3" = 1'-0"



11 STOREFRONT SILL @ CMU/CONC.
3" = 1'-0"



7 6" STOREFRONT JAMB AT PLASTER
3" = 1'-0"



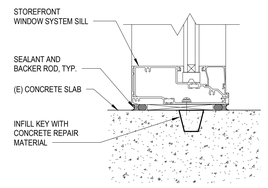
3 STOREFRONT SILL @ STUD WALL
3" = 1'-0"

24 JAMB @ CORNER
3" = 1'-0"

20 CLERESTORY JAMB @ PLASTER
3" = 1'-0"

16 MITERED CORNER @ STOREFRONT SILL
3" = 1'-0"

12 STOREFRONT SILL @ CONCRETE FLOOR
3" = 1'-0"



8 2" X 6" STOREFRONT SILL @ CONCRETE FLOOR
3" = 1'-0"

4 CLERESTORY JAMB @ PLASTER
3" = 1'-0"

11/7/2024 3:30:42 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

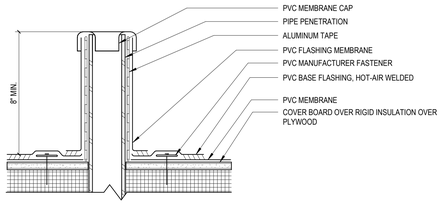
SHEET TITLE:

EXTERIOR WINDOW DETAILS

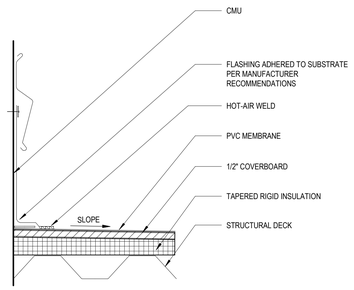
SCALE: 3" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

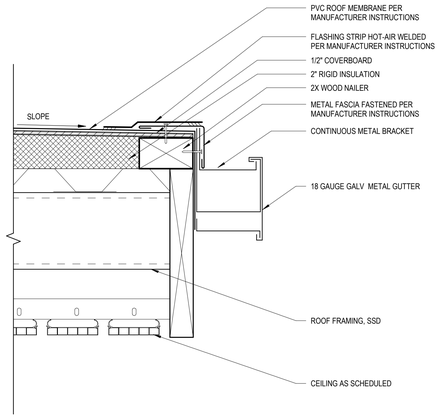
A710



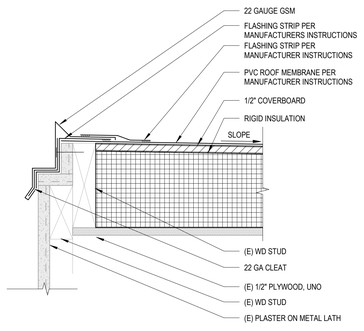
21 VENT STACK FLASHING
3" = 1'-0"



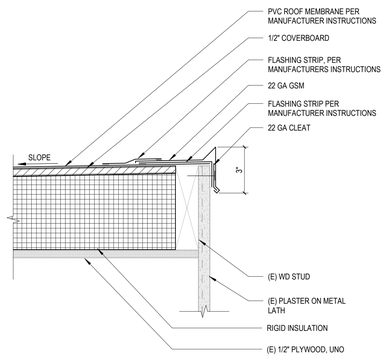
13 SURFACE MOUNTED COUNTER FLASHING
3" = 1'-0"



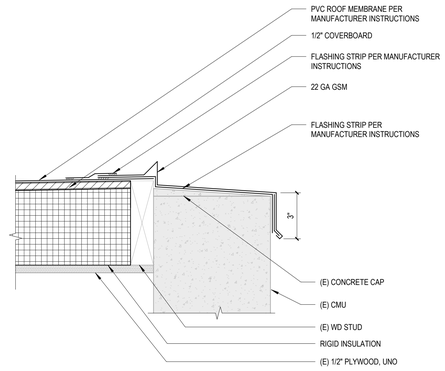
1 GUTTER DETAIL
3" = 1'-0"



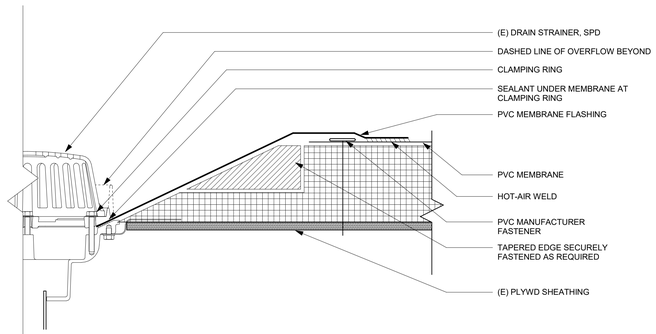
22 (E) FASCIA TYPE C
3" = 1'-0"



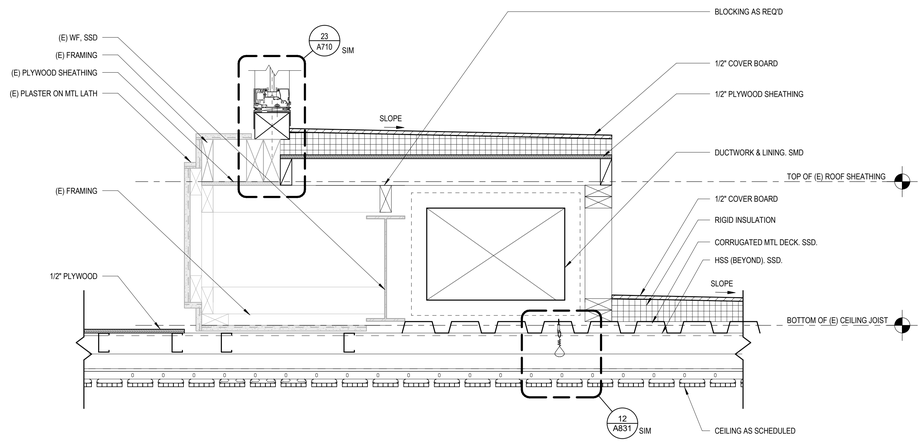
14 (E) FASCIA TYPE B
3" = 1'-0"



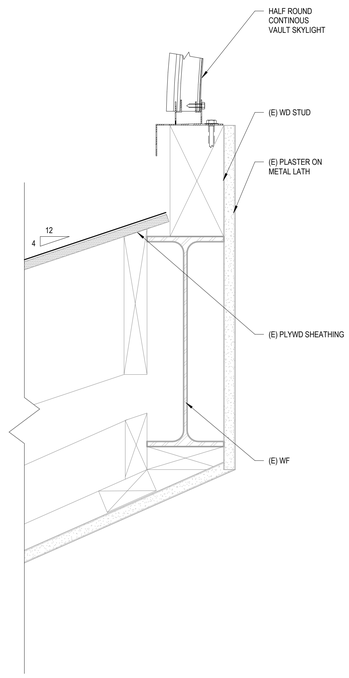
10 (E) FASCIA TYPE A
3" = 1'-0"



6 (E) ROOF DRAIN
3" = 1'-0"



24 MECHANICAL DUCTWORK BOX OUT DETAIL
1 1/2" = 1'-0"



4 SKYLIGHT SILL
3" = 1'-0"

1/7/2024 3:20:44 PM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.286.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

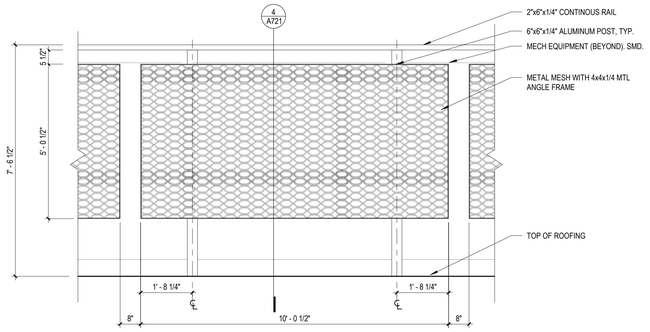
SHEET TITLE:

ROOF DETAILS

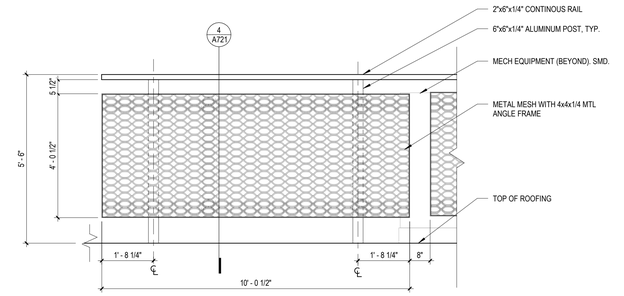
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

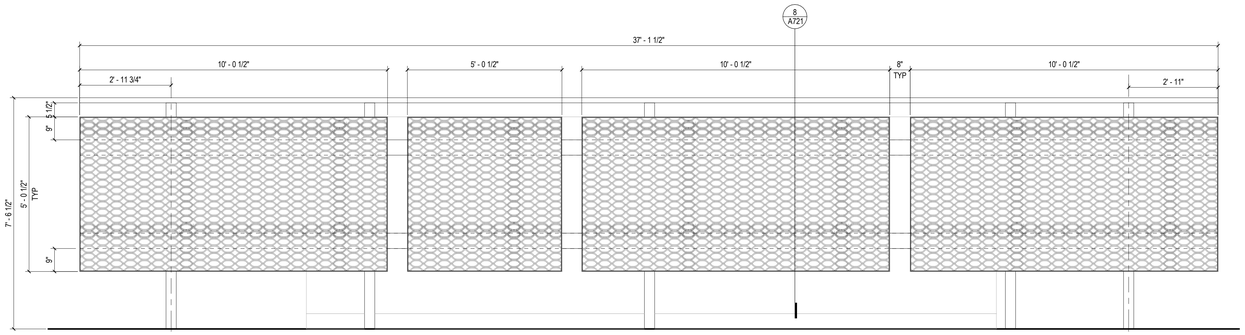
A720



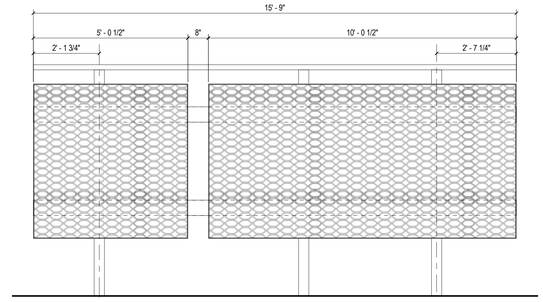
13 TYPICAL ROOF SCREEN ELEVATION - HIGH ROOF
1/2" = 1'-0"



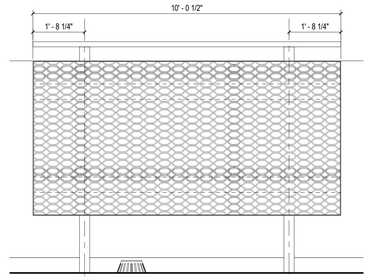
5 TYPICAL ROOF SCREEN ELEVATION - LOW ROOF
1/2" = 1'-0"



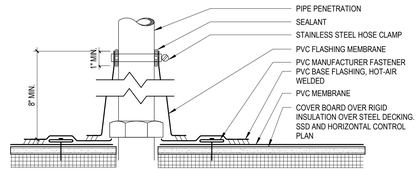
25 ROOF SCREEN AT SOUTH ELEVATION - ELEVATION A
1/2" = 1'-0"



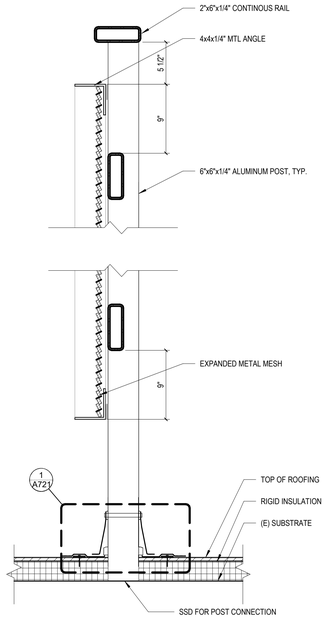
10 ROOF SCREEN AT SOUTH ELEVATION - ELEVATION B
1/2" = 1'-0"



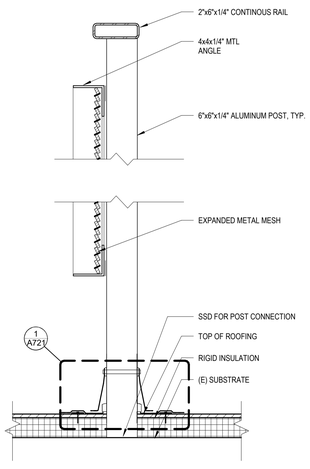
2 ROOF SCREEN AT SOUTH ELEVATION - ELEVATION C
1/2" = 1'-0"



1 CONE FLASHING AT PENETRATION
3" = 1'-0"



8 MECH SCREEN TYP. SECTION DETAIL 1
1 1/2" = 1'-0"



4 MECH SCREEN TYP. SECTION DETAIL 2
1 1/2" = 1'-0"

11/7/2024 3:20:48 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

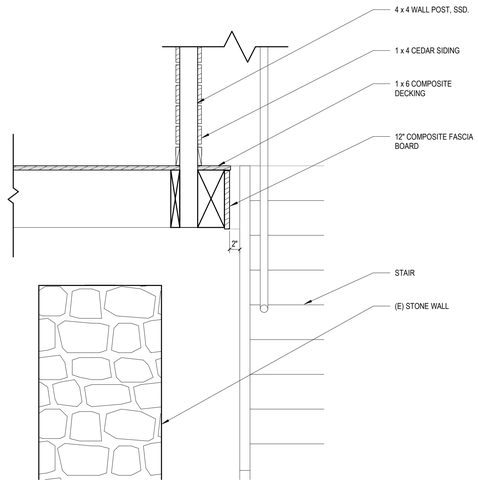
SHEET TITLE:

ROOF SCREEN DETAILS

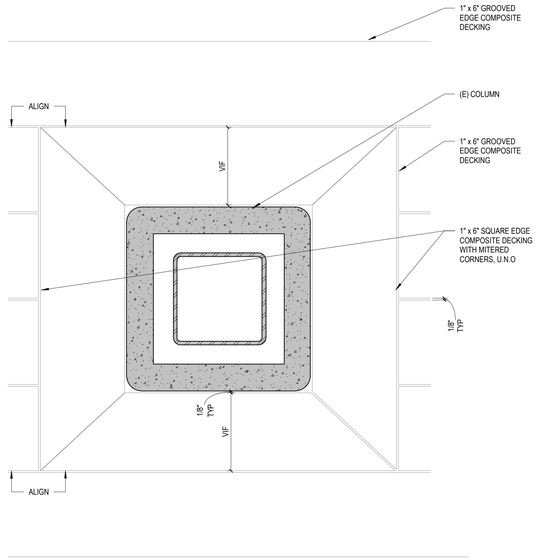
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

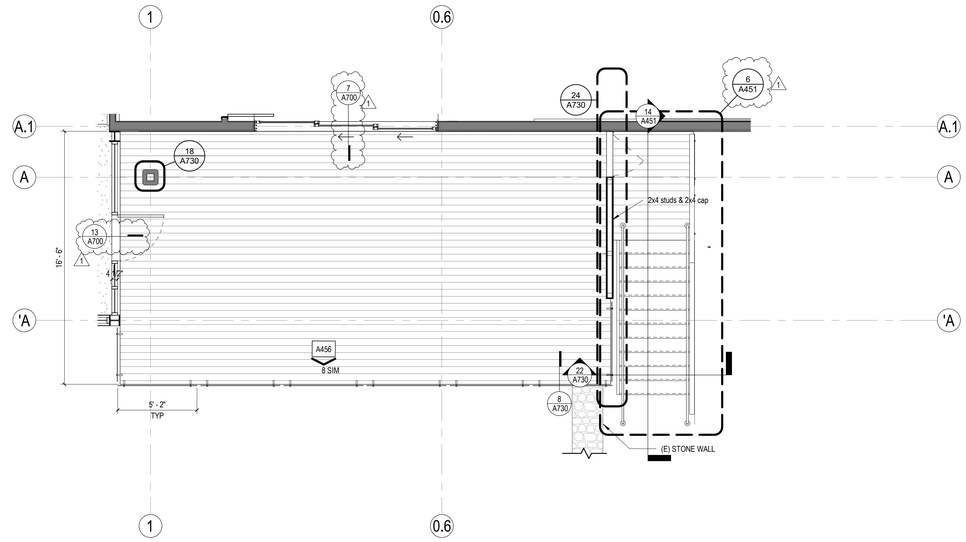
A721



22 COMMUNITY ROOM DECK WALL SECTION
1" = 1'-0"

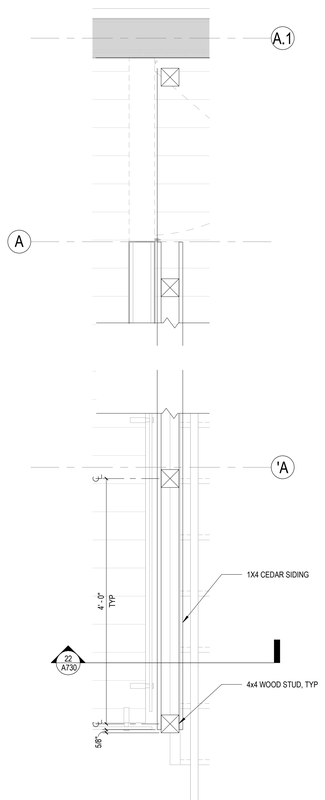


18 COULMN AT DECK ENLARGED PLAN
3" = 1'-0"

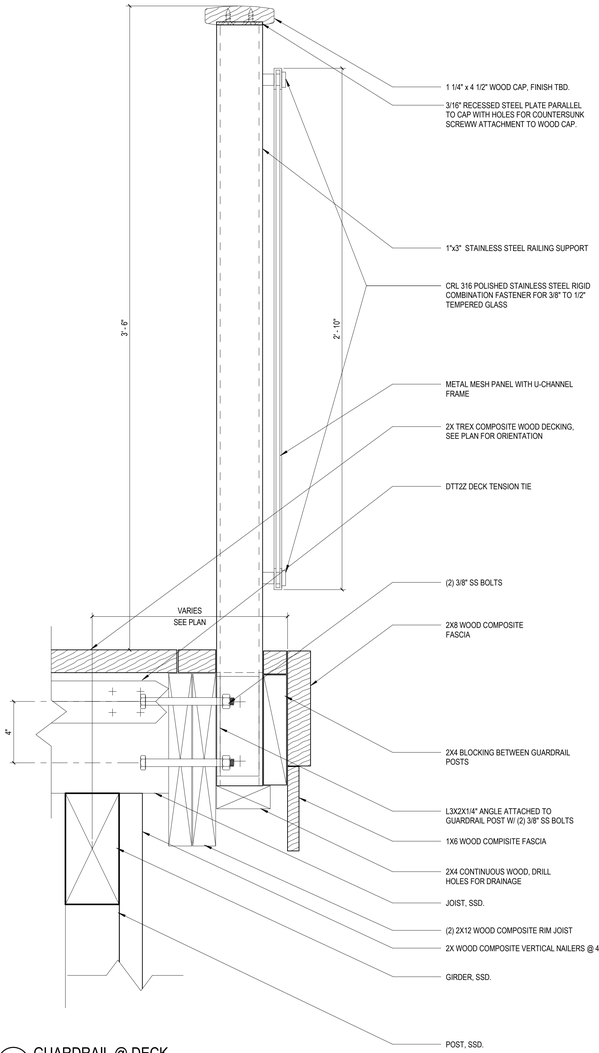


10 COMMUNITY ROOM DECK - ENLARGED PLAN
1/4" = 1'-0"





24 COMMUNITY ROOM DECK WALL @ STAIR - ENLARGED PLAN
1" = 1'-0"



8 GUARDRAIL @ DECK
3" = 1'-0"

11/7/2024 3:20:51 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

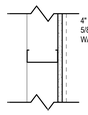
DECK DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brule Architects and may not be duplicated without the written consent of Anderson-Brule Architects. ©

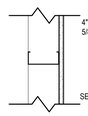
A730

TYPE L6.L: NON-RATED FURRING, 6" ABOVE CEILING



4" METAL STUDS
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

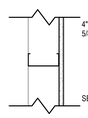
TYPE P6: NON-RATED FURRING, PARTIAL HEIGHT



4" METAL STUDS
5/8" GYPSUM BOARD

SEE INTERIOR ELEVATION FOR PARTITION HEIGHT

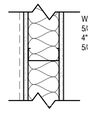
TYPE P6.P: NON-RATED FURRING, PARTIAL HEIGHT WITH WALL CAP



4" METAL STUDS
5/8" GYPSUM BOARD

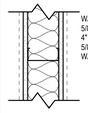
SEE INTERIOR ELEVATION FOR PARTITION HEIGHT

TYPE G6.AL: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



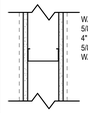
WALL TILE, FINISH OKABS FOR ADDITIONAL INFORMATION
5/8" TILE WALL BACKING
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE G6.AR: NON-RATED ACOUSTICAL PARTITION, 6" ABOVE CEILING



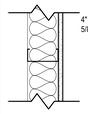
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION
5/8" TILE WALL BACKING
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

TYPE G6.R: NON-RATED PARTITION, 6" ABOVE CEILING



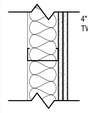
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION
5/8" TILE WALL BACKING
4" METAL STUDS
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

TYPE K6.A: NON-RATED ACOUSTICAL FURRING, FULL HEIGHT



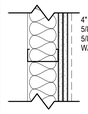
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE K6.AG: NON-RATED ACOUSTICAL FURRING, FULL HEIGHT



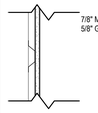
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
TWO LAYERS 5/8" GYPSUM BOARD

TYPE K6.AGL: NON-RATED ACOUSTICAL FURRING, FULL HEIGHT



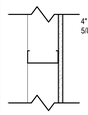
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

TYPE L3: NON-RATED FURRING, 6" ABOVE CEILING



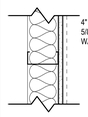
7/8" METAL HAT CHANNEL
5/8" GYPSUM BOARD

TYPE L6: NON-RATED FURRING, 6" ABOVE CEILING



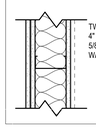
4" METAL STUDS
5/8" GYPSUM BOARD

TYPE L6.AL: NON-RATED ACOUSTICAL FURRING, 6" ABOVE CEILING



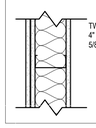
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

TYPE F6.AFL: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



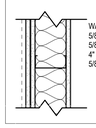
TWO LAYERS OF 5/8" GYP BD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

TYPE F6.AG: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



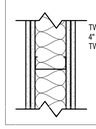
TWO LAYERS 5/8" GYPSUM BOARD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE F6.AGL: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



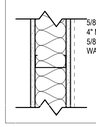
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION
5/8" TILE WALL BACKING
5/8" GYPSUM BOARD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE F6.AH: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



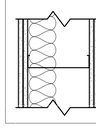
TWO LAYERS 5/8" GYPSUM BOARD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
TWO LAYERS 5/8" GYPSUM BOARD

TYPE F6.AL NON-RATED ACOUSTICAL PARTION, FULL HEIGHT



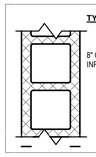
5/8" GYPSUM BOARD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" TILE WALL BACKING
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION

TYPE F7.AG: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



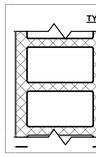
TWO LAYERS 5/8" GYPSUM BOARD
8" MTL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
TWO LAYERS 5/8" GYPSUM BOARD

TYPE F11: NON-RATED CMU WALL FULL HEIGHT



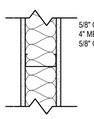
8" CMU, SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION

TYPE F12: NON-RATED CMU WALL FULL HEIGHT



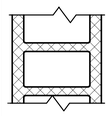
12" CMU, SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION

TYPE G6.A: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



5/8" GYPSUM BOARD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

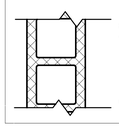
TYPE 1.B12: 1 HOUR RATED CMU WALL, FULL HEIGHT



12" CMU, SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION

CBC TABLE 721.1(2) ITEM 3-1

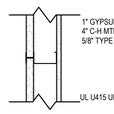
TYPE 1.B8: 1 HOUR RATED CMU WALL, FULL HEIGHT



8" CMU, SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION

CBC TABLE 721.1(2) ITEM 3-1

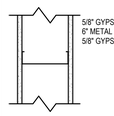
TYPE 1.N9: 1 HOUR RATED SHAFT WALL, FULL HEIGHT



1" GYPSUM LINER PANEL
4" C-H MTL STUDS
5/8" TYPE X GYPSUM BOARD

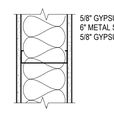
UL U415 UL SYSTEM A

TYPE F2: NON-RATED PARTITION, FULL HEIGHT



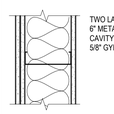
5/8" GYPSUM BOARD
6" METAL STUDS
5/8" GYPSUM BOARD

TYPE F2.A: NON-RATED ACOUSTICAL PARTION, FULL HEIGHT



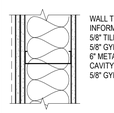
5/8" GYPSUM BOARD
6" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE F2.AG: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



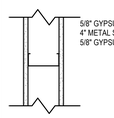
TWO LAYERS 5/8" GYPSUM BOARD
6" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE F2.AGL: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



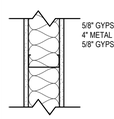
WALL TILE - SEE FINISH PLANS FOR ADDITIONAL INFORMATION
5/8" TILE WALL BACKING
5/8" GYPSUM BOARD
6" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

TYPE F6: NON-RATED PARTITION, FULL HEIGHT



5/8" GYPSUM BOARD
4" METAL STUDS
5/8" GYPSUM BOARD

TYPE F6.A: NON-RATED ACOUSTICAL PARTITION, FULL HEIGHT



5/8" GYPSUM BOARD
4" METAL STUDS W/ ACOUSTICAL BATT INSULATION IN CAVITY
5/8" GYPSUM BOARD

PARTITION NOTES

1. USE LONGER SCREWS OR NAILS TO MAINTAIN PENETRATION / ATTACHMENT REQUIREMENTS FOR NAILS AND SCREWS PER LISTED ASSEMBLY.
2. ALIGN SURFACE OF FINISH BETWEEN PARTITIONS, WHERE TYPES ADJOIN TO FORM A CONTINUOUS PLANE.
3. PROVIDED BLOCKING OR BACKING, SECURELY ATTACHED TO WALL / PARTITION FRAMING, AS NEEDED FOR SECURELY AND FIRMLY MOUNTING ALL WALL / PARTITION MOUNTED EQUIPTMENT, ACCESSORIES, LIGHTS, ETC. REVIEW ARCHITECTURAL AND ENGINEERING DRAWINGS TO IDENTIFY ITEMS THAT WILL REQUIRE BLOCKING OR BACKING. INSTALL BLOCKING OR BACKING, FOR THESE ITEMS AND MARK OR RECORD LOCATIONS, PRIOR TO APPLYING FACING MATERIALS. SEE DETAIL 17/S0.52 FOR BACKING.
4. SEE INTERIOR ELEVATIONS FOR ADDITIONAL WALL FINISHES NOT INDICATED ON PARTITION TYPES.
5. SEE SHEET S0.52 FOR INTERIOR METAL FRAMING DETAILS.
6. FOR FIRE RATED WALLS, SEE 4 / A801
7. FOR ACOUSTICAL WALLS, SEE 2 / A801
8. INSTALL ACOUSTICAL SEALANT AT PERIMITER OF ALL ACOUSTICAL WALLS.

INTERIOR PARTITION TYPE REFERENCE



ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

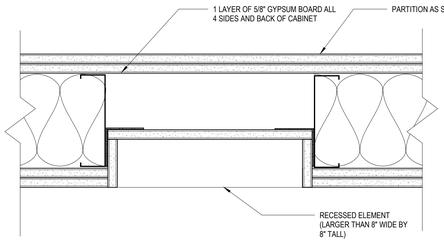
PARTITION TYPES

SCALE: As indicated

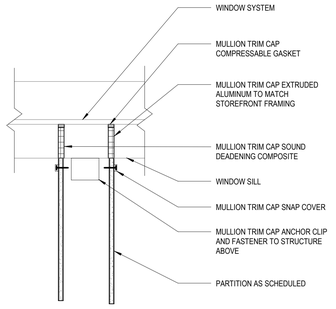
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A800

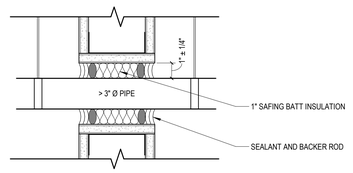
11/7/2024 3:20:55 PM



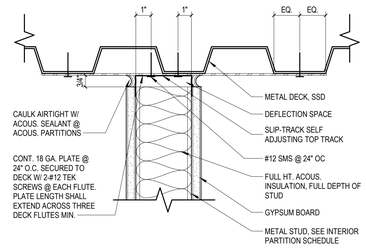
21 PARTITIONS W/ RECESSED DISPLAYS
3" = 1'-0"



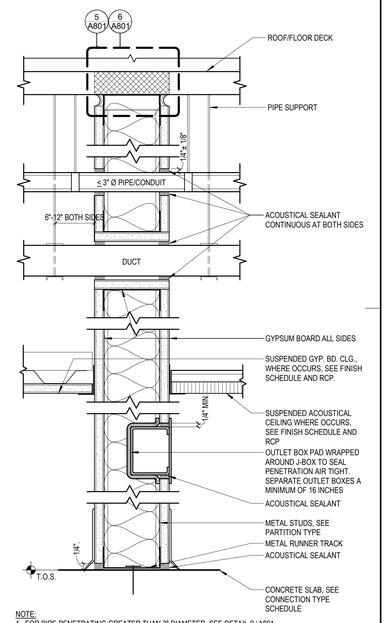
13 PARTITION SOUND BARRIER MULLION TRIM CAP
1 1/2" = 1'-0"



9 PIPE > 3" DIA. @ ACOUSTICAL WALL
3" = 1'-0"

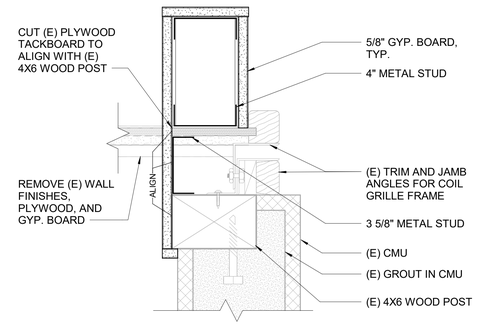


5 NON-RATED HEAD OF WALL PARALLEL TO FLUTES
3" = 1'-0"

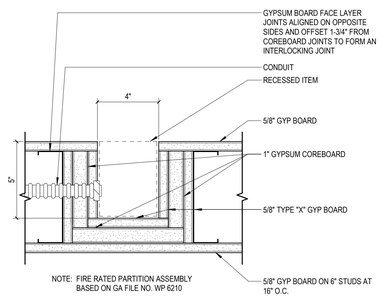


NOTE:
1. FOR PIPE PENETRATING GREATER THAN 3" DIAMETER, SEE DETAIL 9 / A801
2. FOR LARGE OUTLET BOX PENETRATION, SEE DETAIL 10 / A801

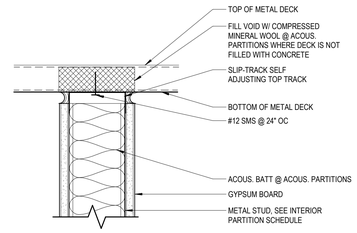
2 TYPICAL ACOUSTICAL WALL
3" = 1'-0"



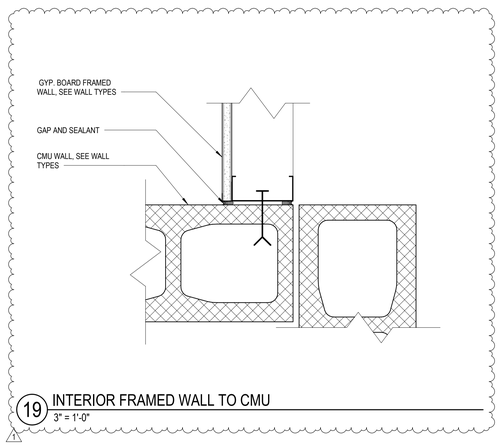
18 JAMB @ (E) COILING GRILLE
3" = 1'-0"



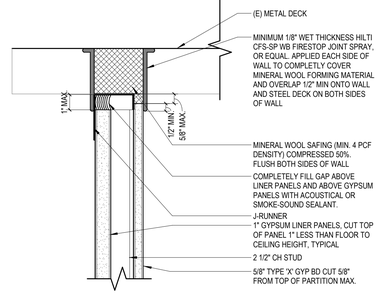
10 RECESSED WALL BOX
3" = 1'-0"



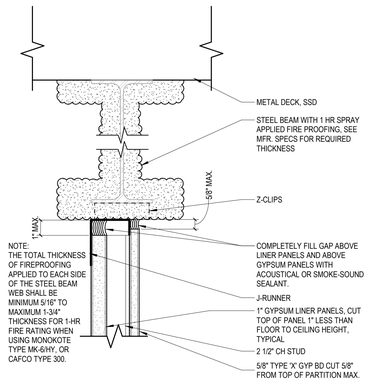
6 NON RATED HEAD OF WALL DETAIL PERPENDICULAR TO DECK FLUTES
3" = 1'-0"



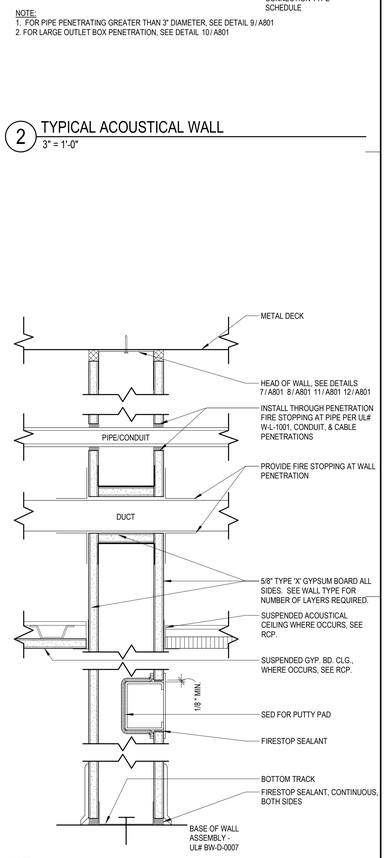
19 INTERIOR FRAMED WALL TO CMU
3" = 1'-0"



11 HEAD OF RATED SHAFT WALL UNDER DECK (UL HW-D-0612
3" = 1'-0"

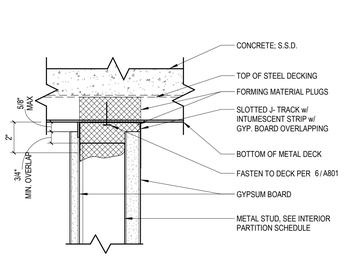


7 HEAD OF RATED SHAFT WALL UNDER BEAM (UL# HW-D-0609)
3" = 1'-0"

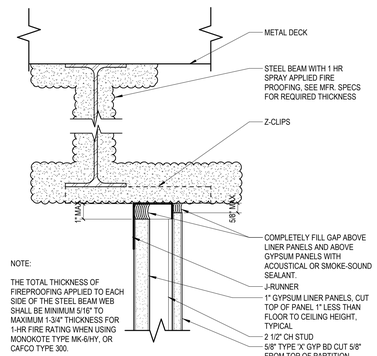


NOTE
1. FOR RECESSED ACCESSORIES OR CABINETS PROVIDE BLOCKING, GYPSUM BOARD AND FIRE STOPPING SIMILAR TO DETAIL AT DUCT.

4 TYP. PENETRATION @ FIRE-RATED WALL
3" = 1'-0"



12 HEAD OF RATED SHAFT WALL PERPENDICULAR @ METAL DECK (UL HW-D-0504)
3" = 1'-0"



8 HEAD OF RATED SHAFT WALL UNDER BEAM SHIFTED (UL# HW-D-0609)
3" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

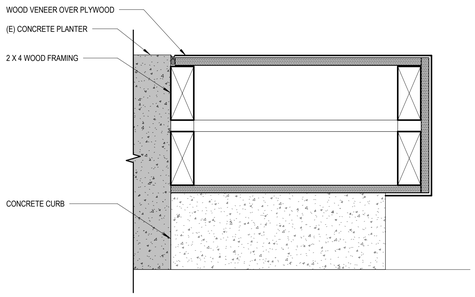
INTERIOR PARTITION DETAILS

SCALE: As indicated

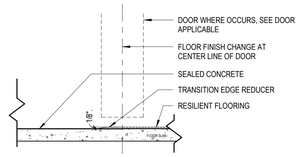
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A801

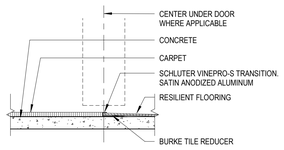
11/7/2024 3:20:58 PM



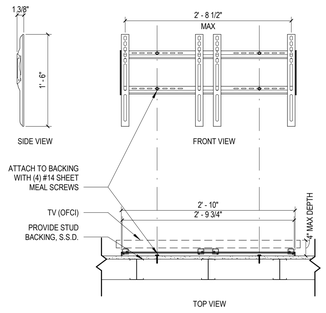
3 FLOOR PLAN - MAIN LEVEL - Section 1
3" = 1'-0"



13 CONCRETE TO RESILIENT FLOORING TRANSITION
3" = 1'-0"

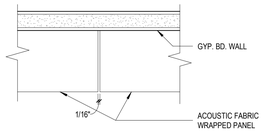


9 CARPET TO RESILIENT FLOORING TRANSITION
3" = 1'-0"



NOTE:
TELEVISIONS AND MOUNT WEIGHT TOTAL AT 200LBS MAX.

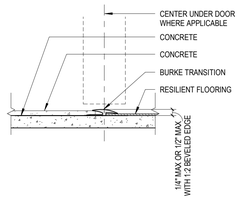
5 TELEVISION MOUNT DETAIL
1" = 1'-0"



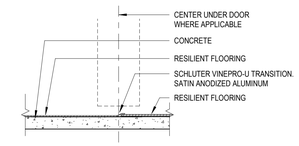
1 FABRIC WRAPPED PANEL BUTT JOINT DETAIL
6" = 1'-0"



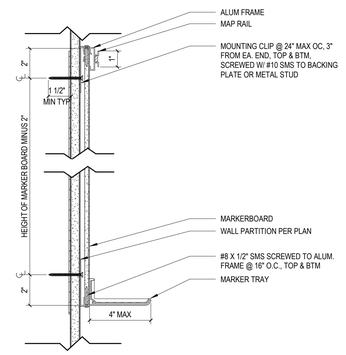
7 Vibia Plus Minus 3D View - For Reference Only
1" = 1'-0"



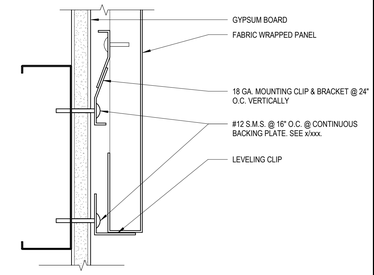
15 CARPET TO CONCRETE FLOORING TRANSITION
3" = 1'-0"



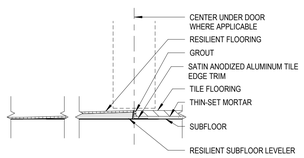
10 CARPET TO TILE FLOORING TRANSITION
3" = 1'-0"



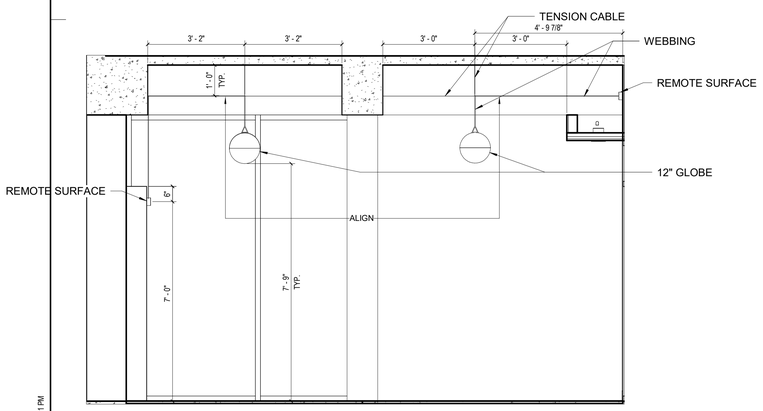
6 MARKER/TACK/PEG BOARD MOUNT
3" = 1'-0"



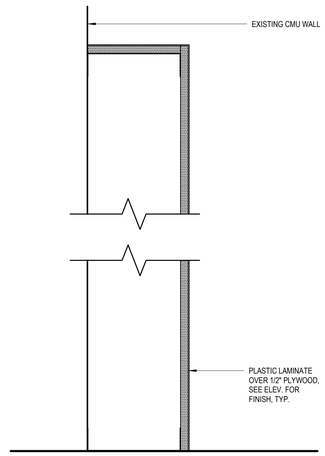
2 FABRIC WRAPPED PANEL AT ATTACHMENT
6" = 1'-0"



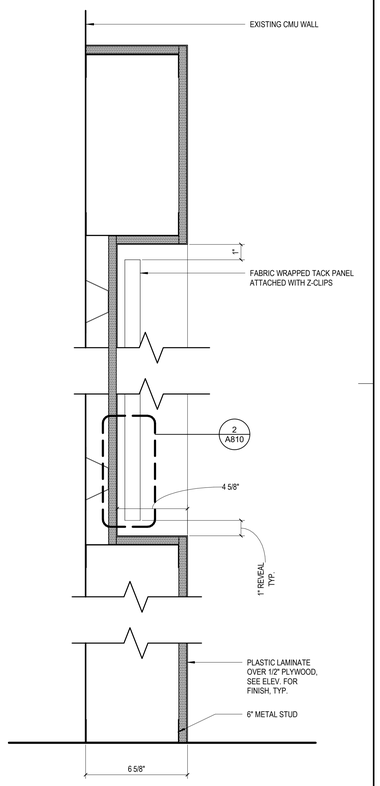
11 RESILIENT TO TILE FLOORING TRANSITION
3" = 1'-0"



24 LIGHT FIXTURE ELVATION @ SOFFIT
1/2" = 1'-0"



8 DONOR WALL
3" = 1'-0"



12 COMMUNITY BOARD
3" = 1'-0"

11/7/2024 3:21:01 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

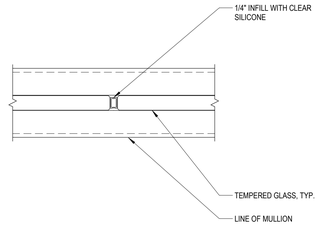
SHEET TITLE:

INTERIOR DETAILS

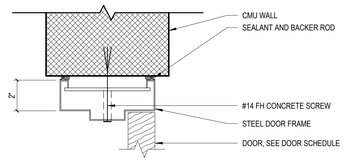
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

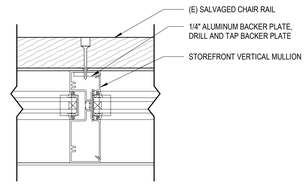
A810



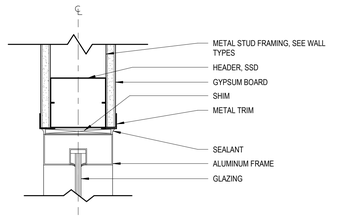
5 GLASS WALL- BUTT JOINT AT GLAZING
6" = 1'-0"



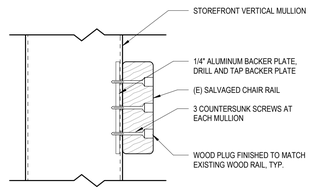
1 MASONRY DOOR HEAD (JAMB SIM.)
3" = 1'-0"



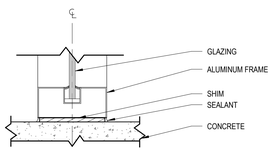
6 CHAIR RAIL PLAN @ STOREFRONT
3" = 1'-0"



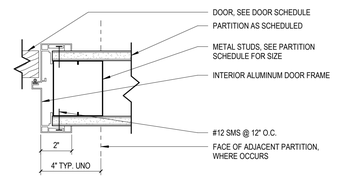
INTERIOR STOREFRONT WINDOW HEAD (JAMB & SILL SIM.)
2 3" = 1'-0"



7 CHAIR RAIL SECTION @ STOREFRONT
3" = 1'-0"



3 INTERIOR STOREFRONT WINDOW SILL
3" = 1'-0"



INTERIOR DOOR- DOOR JAMB, HEAD SIM. (ALUM. FRAME)
4 3" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

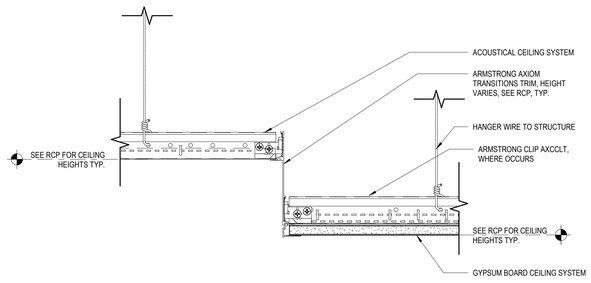
INTERIOR DOOR AND WINDOW DETAILS

SCALE: As indicated

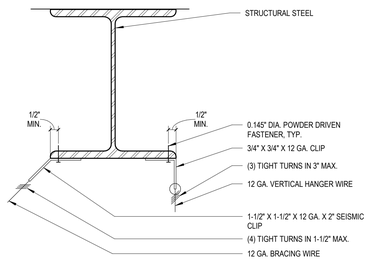
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A820

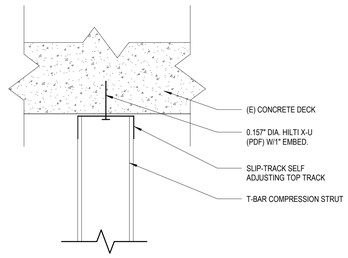
11/7/2024 3:21:03 PM



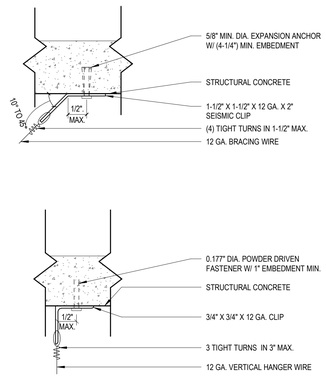
20 ACT TO GYP. BD. TYPICAL TRANSITION
3" = 1'-0"



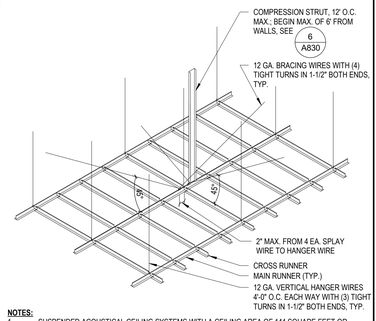
13 WIRE CONNECTIONS AT STEEL
3" = 1'-0"



9 T-BAR COMPRESSION STRUT @ (E) CONC. DECK
3" = 1'-0"

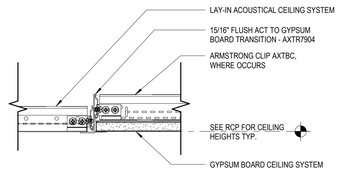


5 WIRE CONNECTIONS AT CONCRETE
3" = 1'-0"

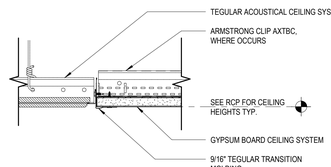


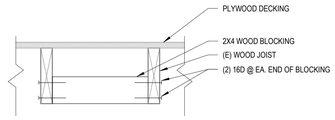
NOTES:
1. SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA OF 144 SQUARE FEET OR LESS, AND FIRE-RATED SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA OF 96 SQUARE FEET OR LESS, SURROUNDED BY WALLS WHICH CONNECT DIRECTLY TO THE STRUCTURE ABOVE, DO NOT REQUIRE COMPRESSION STRUTS WHEN ATTACHED TO TWO ADJACENT WALLS.
2. COMPRESSION STRUT SHALL NOT REPLACE HANGER WIRE.
3. FOR FIXED PERIMETER SEE A/A830
4. FOR PERIMETER SLIP JOINT SEE 3/A830
5. FOR LIGHT FIXTURES, MECHANICAL TERMINALS OR SERVICES, SEE 24/A830

1 SUSPENDED ACOUSTICAL CEILING
3" = 1'-0"

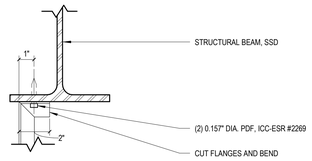


21 LAY-IN ACT TO GYP. BD. FLUSH TRANSITION
3" = 1'-0"

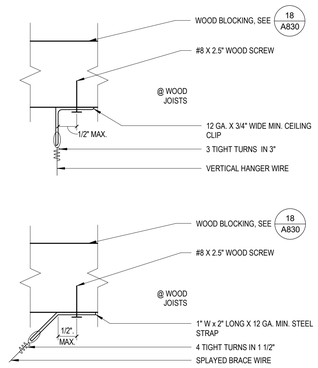




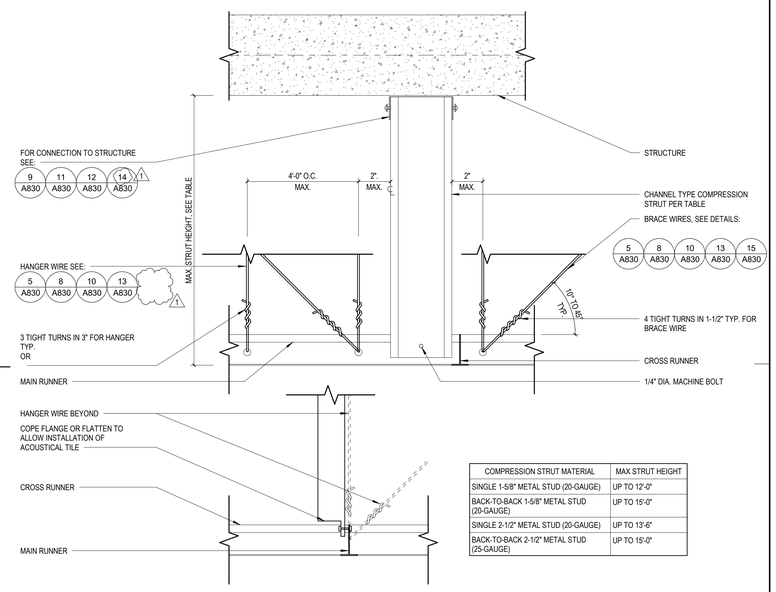
18 TYP. BLOCKING AT (E) WOOD FRAMING
1 1/2" = 1'-0"



14 STRUT CONNECTION @ STEEL BEAM
3" = 1'-0"

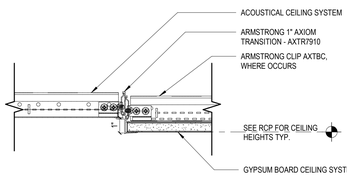


10 WIRE CONNECTIONS @ WOOD JOISTS
3" = 1'-0"

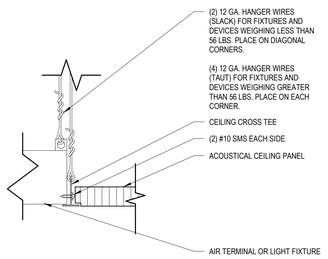


COMPRESSION STRUT MATERIAL	MAX STRUT HEIGHT
SINGLE 1-5/8" METAL STUD (20-GAUGE)	UP TO 12'-0"
BACK-TO-BACK 1-5/8" METAL STUD (20-GAUGE)	UP TO 15'-0"
SINGLE 2-1/2" METAL STUD (20-GAUGE)	UP TO 13'-6"
BACK-TO-BACK 2-1/2" METAL STUD (25-GAUGE)	UP TO 15'-0"

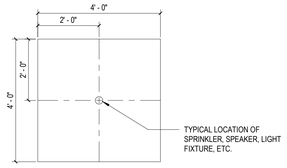
6 SUSPENDED ACOUSTICAL CEILING - COMPRESSION STRUT STRUT
3" = 1'-0"



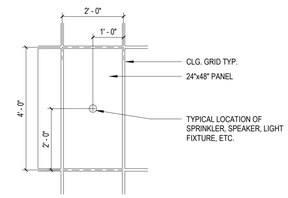
23 ACT TO GYP. BD. 1" TRANSITION
3" = 1'-0"



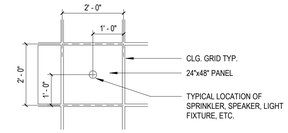
24 LIGHT FIXTURE OR AIR TERMINAL SUPPORT
3" = 1'-0"



A - FIXTURE AT 48"x48" PANEL



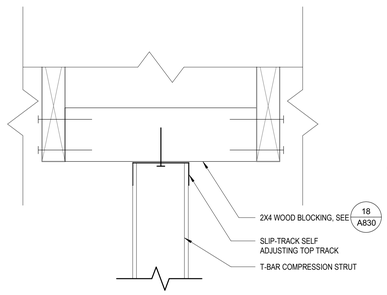
C - FIXTURE AT 24"x48" PANEL



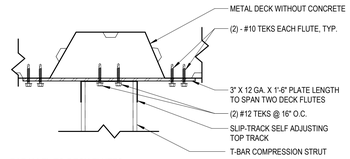
D - FIXTURE AT 24"x24" PANEL

GENERAL NOTES:
1. MOUNT ALL FIXTURES AS SHOWN, U.N.O.
2. "FIXTURES" INCLUDE: LIGHTS, FIRE SPRINKLERS, EXIT SIGNS, SPEAKERS, ETC.

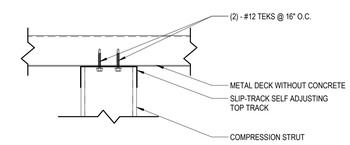
19 TYP. MOUNTING LOCATIONS
1/2" = 1'-0"



11 T-BAR COMPRESSION STRUT @ WOOD JOIST
3" = 1'-0"

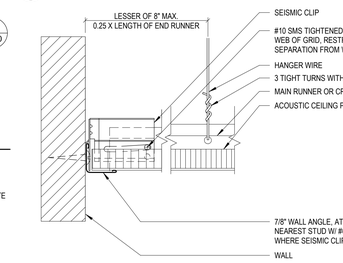


B PARALLEL TO DECK FLUTES



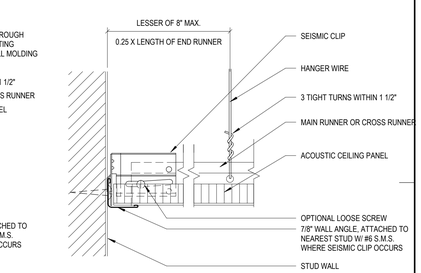
A PERPENDICULAR DECK FLUTES

12 T-BAR COMPRESSION STRUT @ WOOD JOIST
3" = 1'-0"



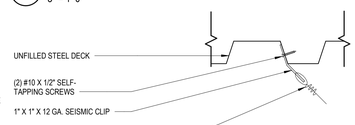
NOTE: FOR SUSPENDED CEILING SEISMIC CLIPS, SEE ICC ES EVALUATION REPORT:
- ESR-1308 FOR ARMSTRONG
- ESR-1222 FOR USG DONN
- ESR-2631 FOR CHICAGO METALIC

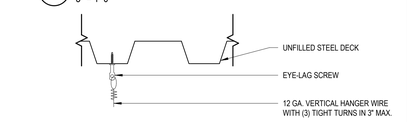
7 SUSP. ACOUS. CLG. PERIMETER (FIXED END)
3" = 1'-0"



NOTE: FOR SUSPENDED CEILING SEISMIC CLIPS, SEE ICC ES EVALUATION REPORT:
- ESR-1308 FOR ARMSTRONG
- ESR-1222 FOR USG DONN
- ESR-2631 FOR CHICAGO METALIC

3 SUSP. ACOUS. CLG. PERIMETER SLIP JOINT
3" = 1'-0"





8 WIRE CONNECTION TO METAL DECK
3" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024
SHEET TITLE:

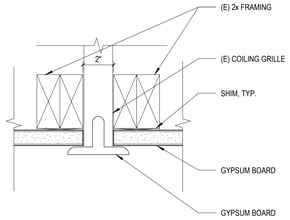
CEILING DETAILS

SCALE: As indicated

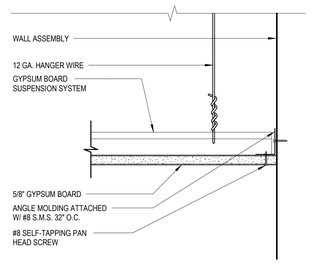
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A830

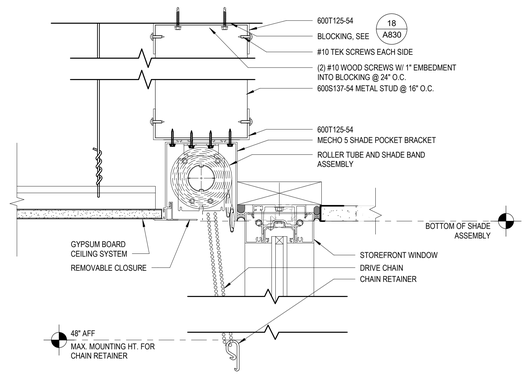
11/7/2024 3:21:06 PM



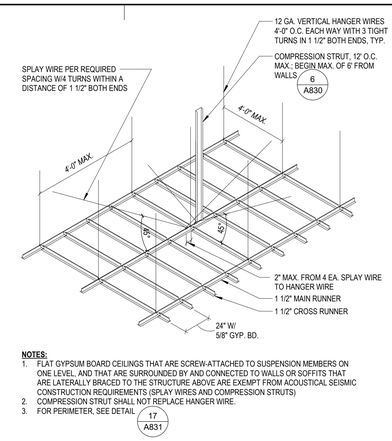
21 (E) COILING GRILLE AT CEILING
3" = 1'-0"



17 GYPSUM BOARD CEILING PERIMETER
3" = 1'-0"

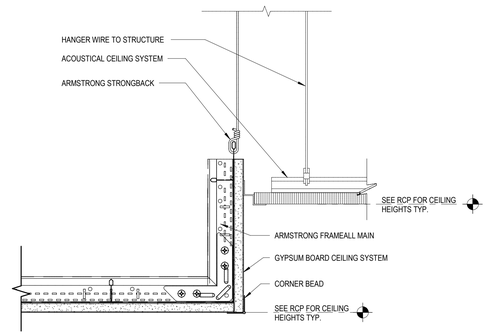


9 MANUAL WINDOW SHADE
3" = 1'-0"

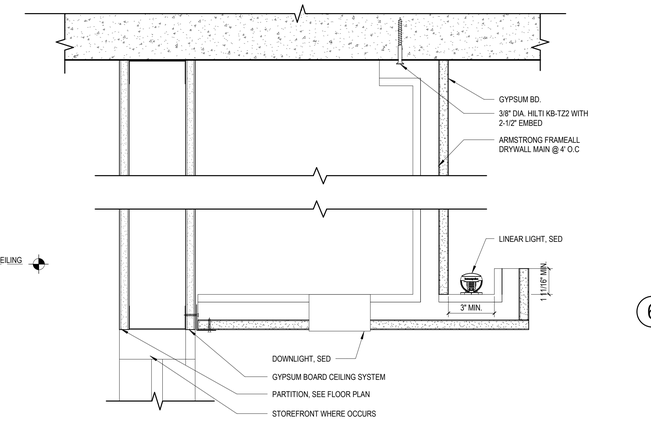


NOTES:
1. FLAT GYPSUM BOARD CEILINGS THAT ARE SCREW-ATTACHED TO SUSPENSION MEMBERS ON ONE LEVEL, AND THAT ARE SURROUNDED BY AND CONNECTED TO WALLS OR SOFFITS THAT ARE LATERALLY BRACED TO THE STRUCTURE ABOVE ARE EXEMPT FROM ACOUSTICAL SEISMIC CONSTRUCTION REQUIREMENTS (SPLAY WIRES AND COMPRESSION STRUTS)
2. COMPRESSION STRUT SHALL NOT REPLACE HANGER WIRE.
3. FOR PERIMETER, SEE DETAIL 17 A831

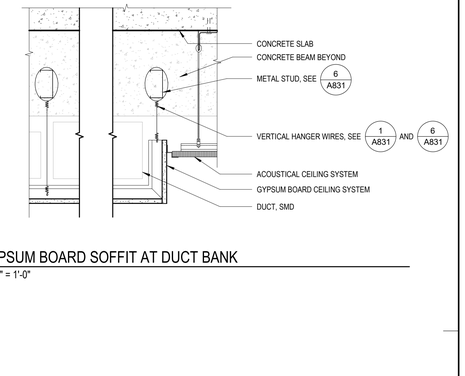
5 TYP. GYPSUM BOARD SUSPENDED CEILING
3" = 1'-0"



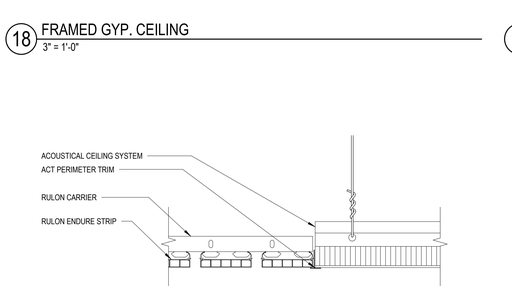
18 FRAMED GYP. CEILING
3" = 1'-0"



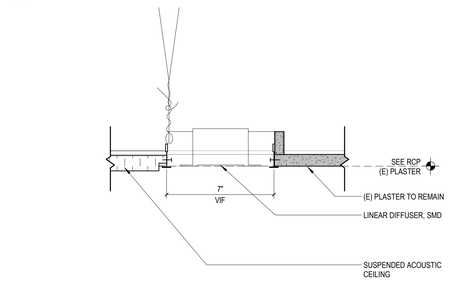
10 FRAMED GYP. CEILING @ LINEAR LIGHTS
3" = 1'-0"



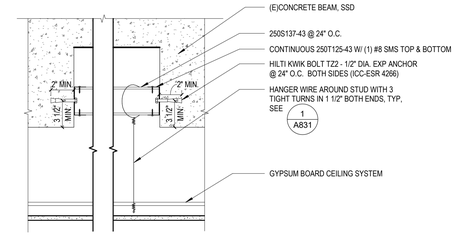
6 GYPSUM BOARD SOFFIT AT DUCT BANK
1 1/2" = 1'-0"



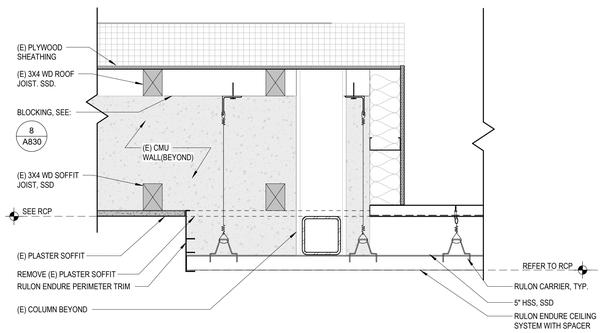
19 RULON TO ACOUSTICAL CEILING TRANSITION
3" = 1'-0"



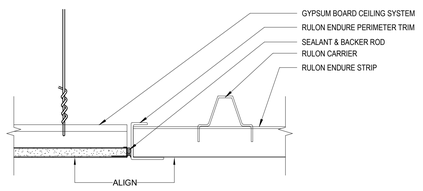
11 DIFFUSER STRIP
3" = 1'-0"



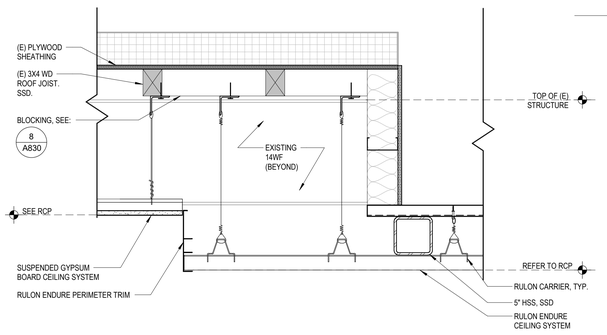
7 CEILING HANGER BETWEEN BEAMS 2
1 1/2" = 1'-0"



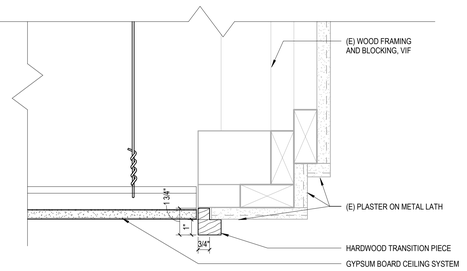
24 (E)GYP SOFFIT TO RULON CEILING
1 1/2" = 1'-0"



20 RULON TO GYP CEILING TRANSITION
3" = 1'-0"



12 ADULT CEILING TO MAIN LOBBY CEILING
1 1/2" = 1'-0"



8 (E) PLASTER TO GYPSUM BOARD AT INTERIOR SOFFIT
3" = 1'-0"

11/7/2024 3:21:10 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

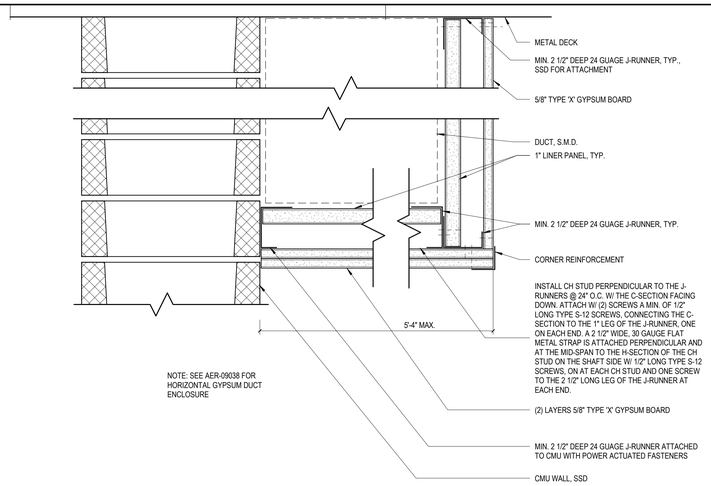
SHEET TITLE:

CEILING DETAILS

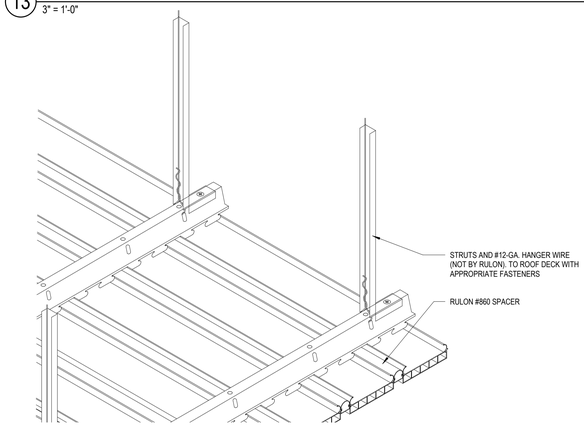
SCALE: As indicated

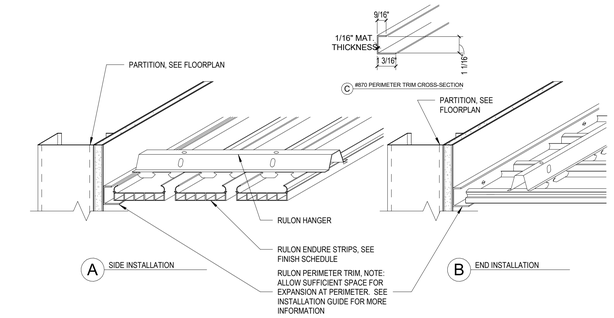
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A831

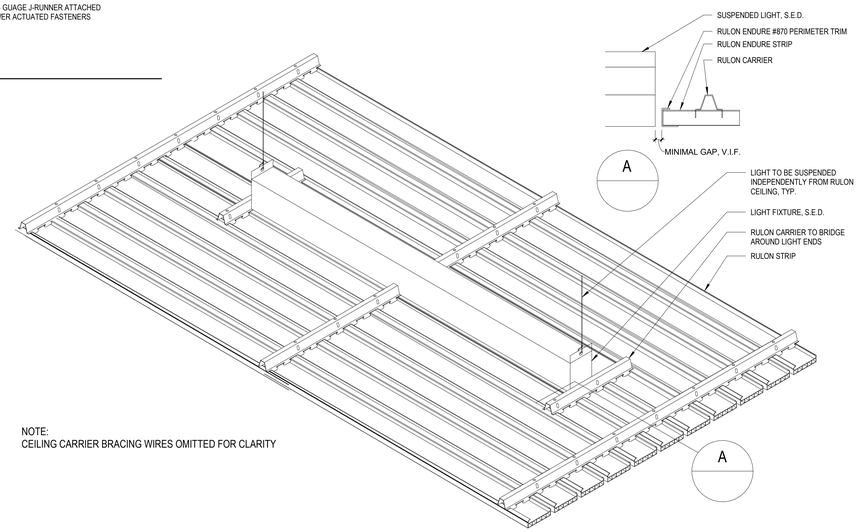


13 HORIZONTAL RATED SHAFT
3" = 1'-0"



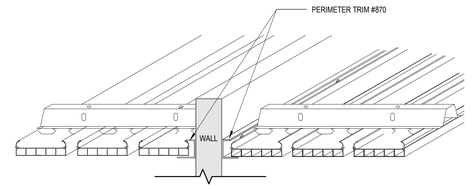


5 RULON - PERIMETER EDGE MOUNTING DETAILS
3" = 1'-0"

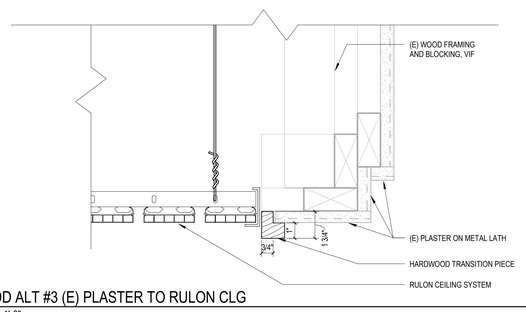


14 RULON - EXTERIOR INSTALLATION
3" = 1'-0"

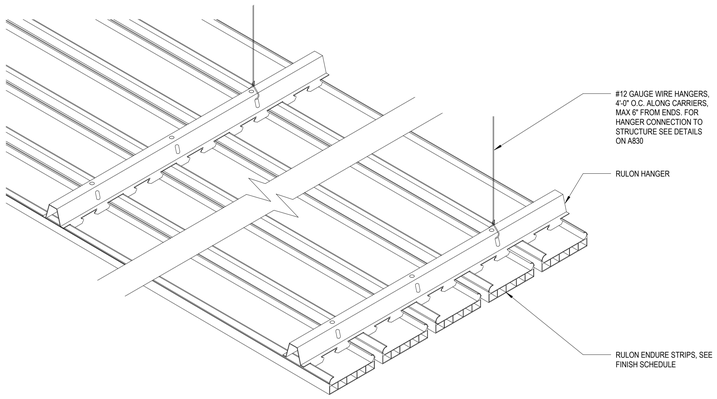
10 RULON - LINEAR FIXTURE
1 1/2" = 1'-0"



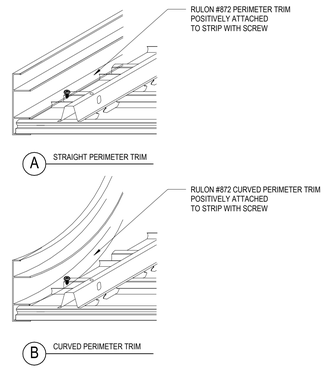
7 RULON - WALL TRANSITION
3" = 1'-0"



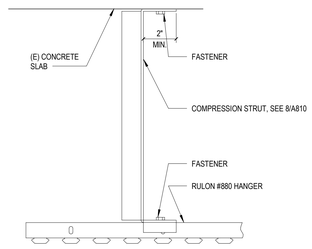
24 ADD ALT #3 (E) PLASTER TO RULON CLG
3" = 1'-0"



16 RULON - CEILING SUSPENSION
3" = 1'-0"



8 RULON - PERIMETER FASCIA
3" = 1'-0"



4 RULON - COMPRESSION STRUT
3" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1 BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

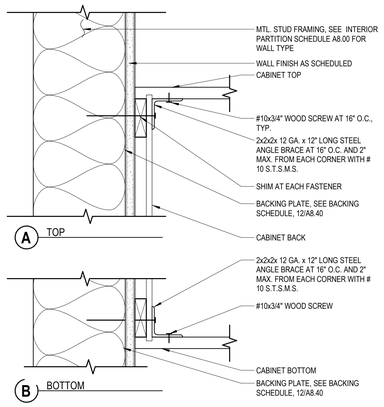
CEILING DETAILS

SCALE: As indicated

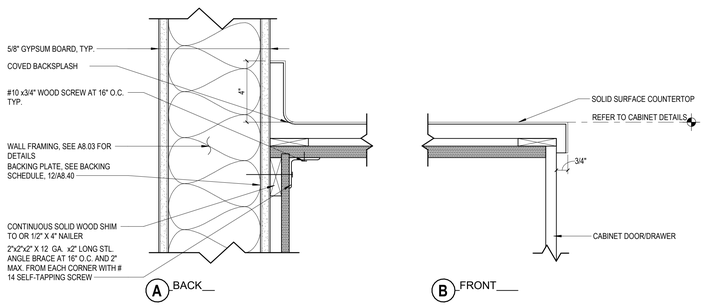
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A832

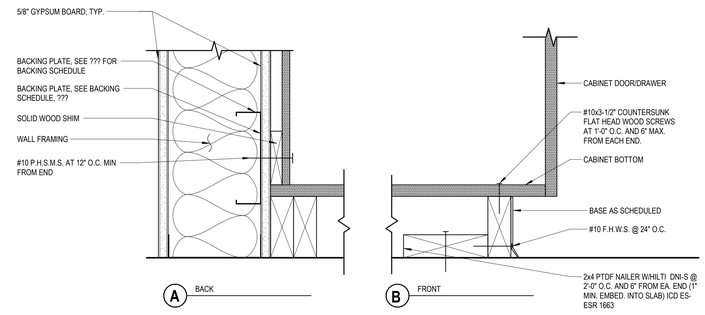
11/7/2024 3:21:13 PM



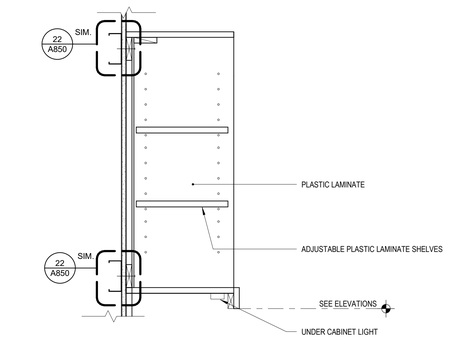
22 UPPER CABINET ANCHORAGE DETAIL
3" = 1'-0"



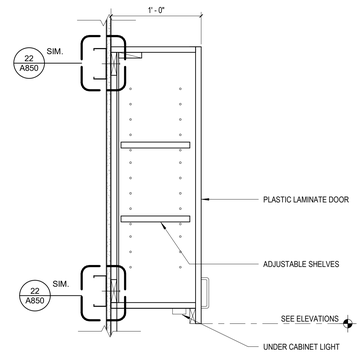
23 BASE CABINET ANCHORAGE AT WALL
3" = 1'-0"



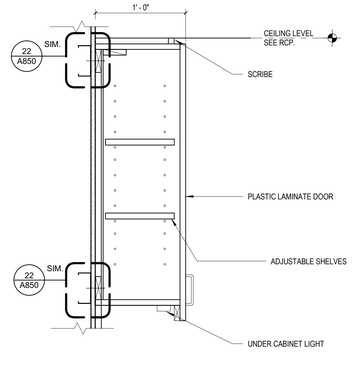
24 BASE CABINET ANCHOARGE AT FLOOR
3" = 1'-0"



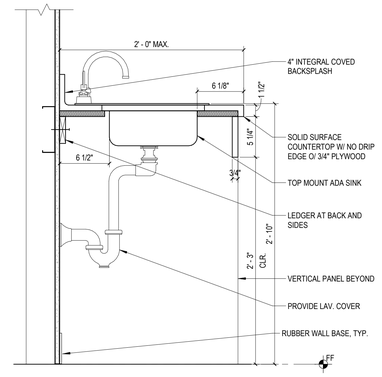
9 TYPICAL OPEN UPPER CABINET
1 1/2" = 1'-0"



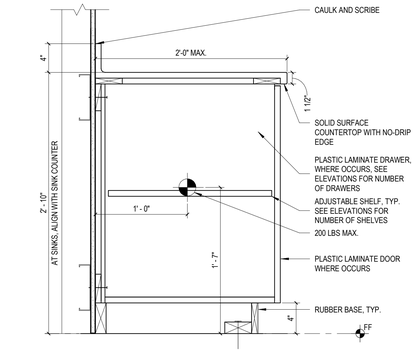
5 TYPICAL UPPER CABINET
1 1/2" = 1'-0"



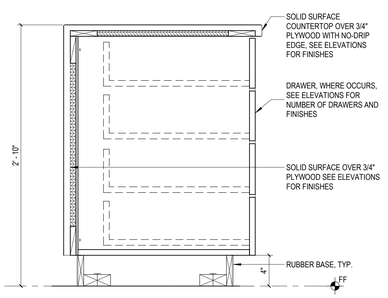
1 TYPICAL UPPER CABINET
1 1/2" = 1'-0"



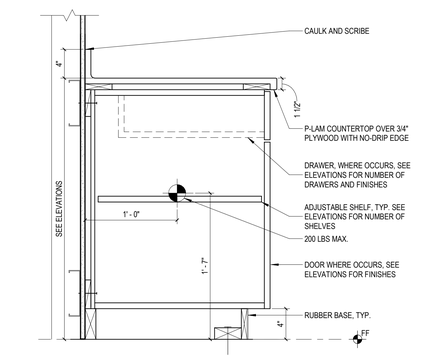
6 ACCESSIBLE SINK AT 24" DEEP COUNTER
1 1/2" = 1'-0"



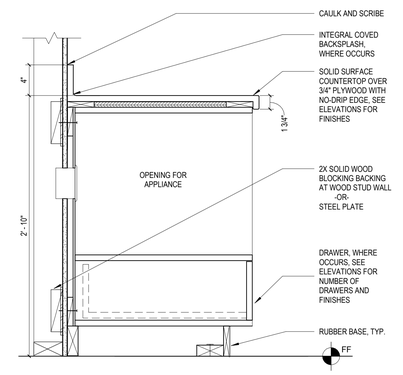
2 BASE CABINETS WITH DOORS
1 1/2" = 1'-0"



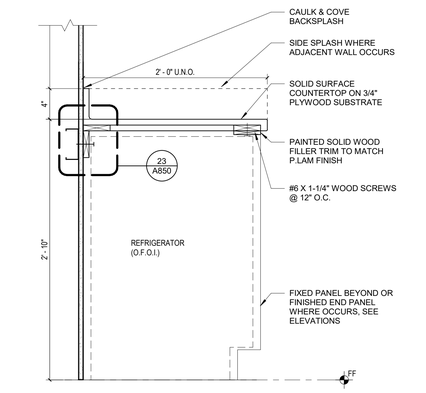
7 BASE CABINETS WITH DRAWERS
1 1/2" = 1'-0"



3 BASE CABINET WITH DOORS AND ONE DRAWER
1 1/2" = 1'-0"



8 BASE CABINET WITH MICROWAVE
1 1/2" = 1'-0"



4 TYPICAL COUNTER AT EQUIP.
1 1/2" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

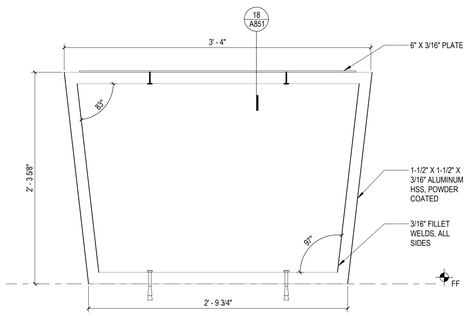
CASEWORK DETAILS

SCALE: As indicated

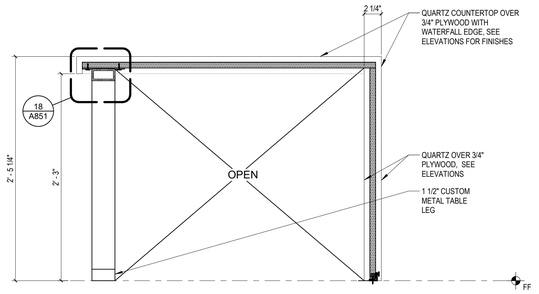
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

A850

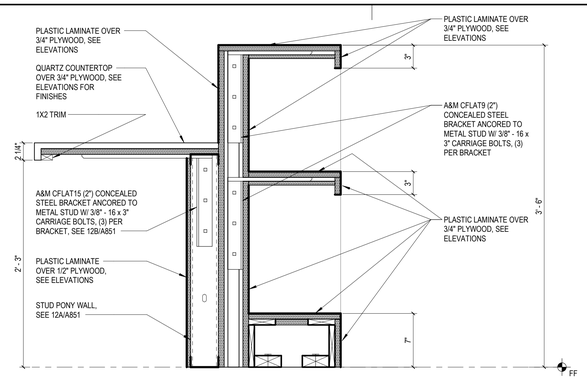
11/7/2024 3:21:15 PM



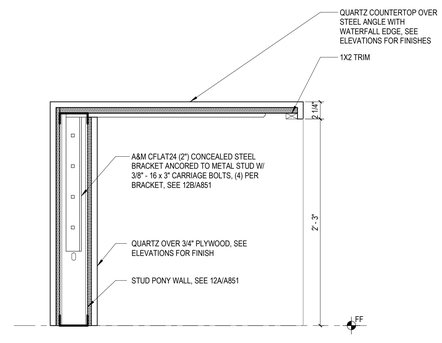
17 SERVICE DESK - ACCESSIBLE COUNTER CUSTOM LEG
1 1/2" = 1'-0"



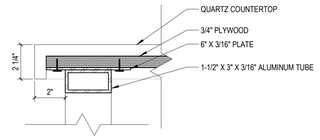
13 SERVICE DESK - CUSTOM LEG ACCESSIBLE COUNTER
1 1/2" = 1'-0"



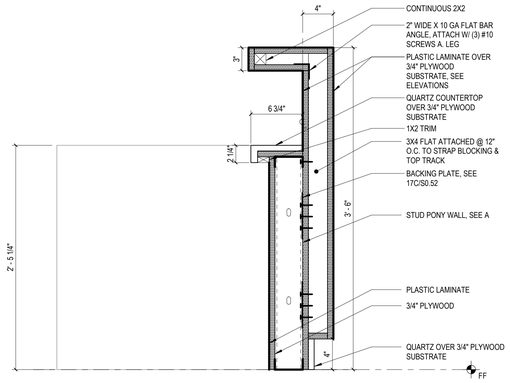
9 SERVICE DESK - DISPLAY SHELVES
1 1/2" = 1'-0"



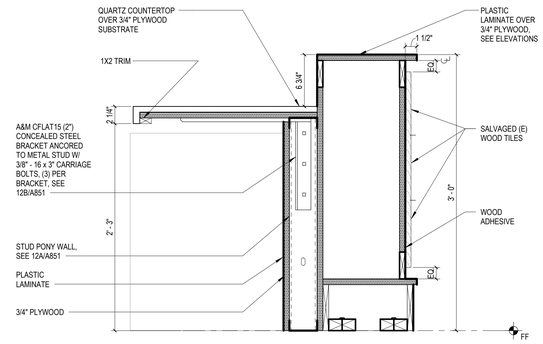
1 SERVICE DESK - ACCESSIBLE COUNTER
1 1/2" = 1'-0"



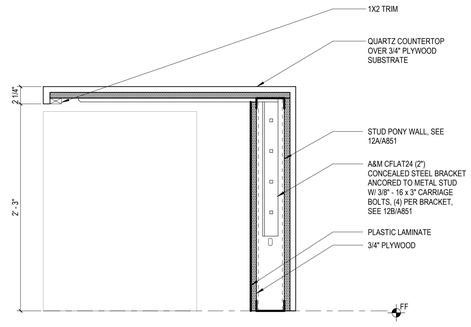
18 ENLARGED DETAIL - CUSTOM LEG ATTACHMENT
3" = 1'-0"



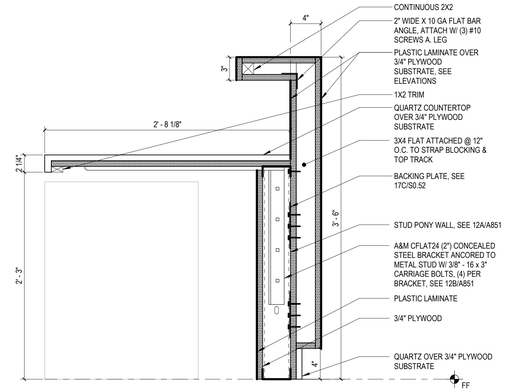
14 SERVICE DESK - STANDING COUNTER @ DESK ALCOVE
1 1/2" = 1'-0"



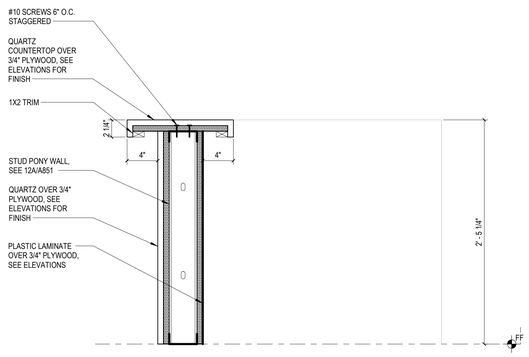
10 SERVICE DESK - TILE UNIT
1 1/2" = 1'-0"



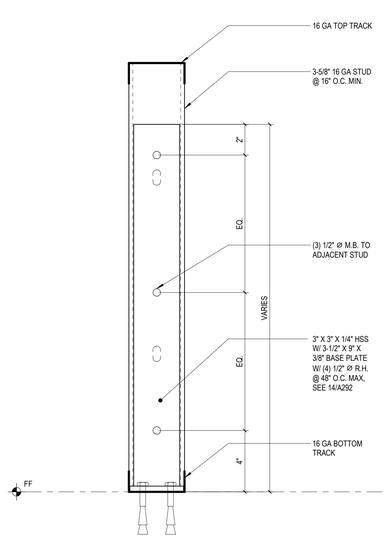
2 SERVICE DESK - COUNTER
1 1/2" = 1'-0"



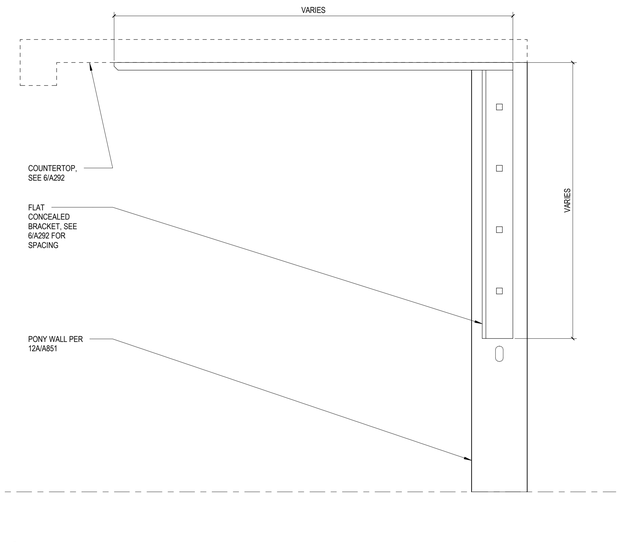
15 SERVICE DESK - STANDING COUNTER
1 1/2" = 1'-0"



16 SERVICE DESK - HEIGHT ADJUSTABLE DESK ALCOVE
1 1/2" = 1'-0"



A TYPICAL PONY WALL FRAMING



B TYPICAL COUNTER SUPPORT

12 PONY WALL & COUNTER SUPPORT
3" = 1'-0"

11/7/2024 3:21:18 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

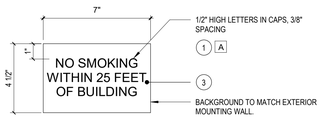
SHEET TITLE:

CASEWORK DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

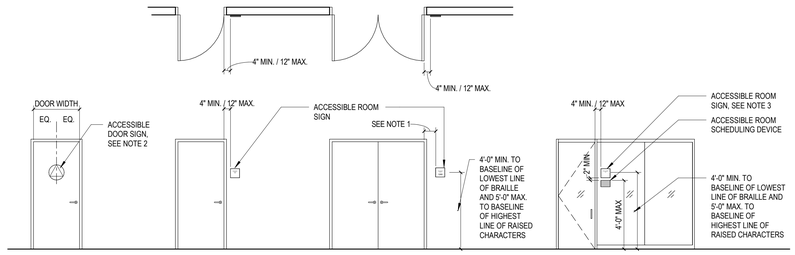
A851



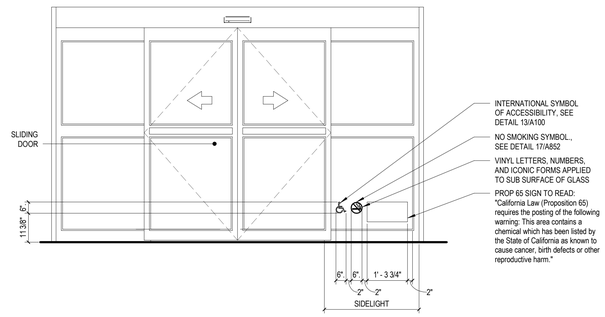
NOTES:
1. SIGN MATERIAL SHALL BE 1/8" THICK ACRYLIC PLASTIC WITH 1/32" RAISED GRAPHIC AND LETTERS.
2. CENTER LINE OF SIGN TO BE MOUNTED AT 5'-0" A.F.F.

17 NO SMOKING SIGN
3" = 1'-0"

NOTES:
1. SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR. WHERE THERE IS NO WALL SPACE ON THE LATCH SIDE, INCLUDING DOUBLE LEAF DOORS, SIGNS SHALL BE PLACED ON THE NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT. MOUNTING HEIGHT SHALL BE PER DETAIL.
MOUNTING LOCATION SHALL BE DETERMINED SO THAT A PERSON MAY APPROACH WITHIN 3" OF SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR. FOR PAIRS OF DOORS WHERE DOOR SWING IS LIMITED TO 90 DEGREE, MOUNT SIGN 9" FROM EDGE OF DOOR. FOR PAIRS OF DOORS WHERE DOOR SWING EXCEEDS 90 DEGREES, MOUNT SIGN DOOR WIDTH PLUS 9" FROM EDGE OF DOOR.
2. SEE DETAIL 7/A852 FOR TOILET ROOM SIGNAGE REQUIREMENTS.
3. MOUNTING
   - SIGNS AND DEVICES MOUNTED ON GLAZING SHALL BE ATTACHED WITH HIGH BOND FOAM TAPE AND SILICONE ADHESIVE. APPLY WHITE VINYL BACKER ON INSIDE OF GLASS TO HIDE ATTACHMENTS; VINYL SIZE TO MATCH SIZE OF SIGN OR DEVICE.
   - SIGNS MOUNTED ON WALLS AND DOORS SHALL BE ATTACHED WITH HIGH BOND FOAM TAPE AND SILICONE ADHESIVE



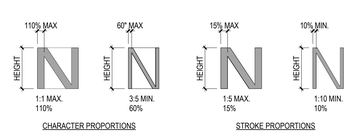
13 DOOR SIGNAGE LOCATIONS & MOUNTING1
1/4" = 1'-0"



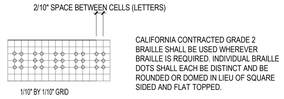
1 ENTRY DOOR ID
1/2" = 1'-0"

1. CHARACTER TYPE: CHARACTERS AND SYMBOLS ON SIGNS SHALL BE RAISED 1/32" (0.794 mm) MINIMUM. TYPOGRAPHY SHALL BE UPPERCASE CHARACTERS. (SEE NOTE 6 FOR TYPOGRAPHY TYPES) ACCOMPANIED BY GRADE 2 BRAILLE (SEE NOTE 5 BELOW).
2. CHARACTER SIZE: RAISED CHARACTERS SHALL BE A MINIMUM OF 5/8" (15.9 mm) AND A MAXIMUM OF 2 INCHES (51 mm) HIGH.
3. FINISH AND CONTRAST: CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACK-GROUND PER 11B-703.5.1
4. PROPORTIONS: VISUAL CHARACTERS ON SIGNS SHALL BE SELECTED FROM FONTS WHERE THE WIDTH OF THE UPPERCASE LETTER 'O' IS 60 PERCENT MINIMUM AND 110 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER 'I'. STROKE THICKNESS OF THE UPPERCASE LETTER 'I' SHALL BE 10 PERCENT MINIMUM AND 20 PERCENT MAXIMUM OF THE HEIGHT OF THE CHARACTER. WHERE VISUAL CHARACTERS ALSO SERVE AS TACTILE CHARACTERS THE STROKE THICKNESS SHALL BE 10% MIN AND 15% MAX.
5. BRAILLE: CALIFORNIA CONTRACTED GRADE 2 BRAILLE SHALL BE USED WHEREVER BRAILLE IS REQUIRED IN OTHER PORTIONS OF THESE STANDARDS. DOTS SHALL BE 1/10 INCH (2.54 mm) ON CENTERS IN EACH CELL WITH 2/10 INCH (5.08 mm) SPACE BETWEEN CELLS, MEASURED M THE SECOND COLUMN OF DOTS IN THE FIRST CELL TO THE FIRST COLUMN OF DOTS IN THE SECOND CELL. DOTS SHALL BE RAISED A MINIMUM OF 1/40 INCH (0.635 mm) ABOVE THE BACKGROUND. ***(SEE DETAIL 10 / A852 FOR ADDITIONAL INFORMATION)*** PLEASE NOTE, BRAILLE SHOWN ON DRAWINGS DO NOT REFLECT ACURATE CHARACTERS.
6. TYPOGRAPHY SHALL BE:
   (EXAMPLE): A - GILL SANS REGULAR
   (EXAMPLE): B - GILL SANS BOLD
7. PAINT COLOR PALETTE SHALL BE:
   1 TO MATCH: |C| 1012 EXTREME WHITE
   2 TO MATCH: P7 - SEE FINISH LEGEND
   3 TO MATCH: |C| 991 WEXFORD FOG
   4 TO MATCH: |C| 991 WEXFORD FOG
   4 BLUE TO MATCH: BLUE PER FEDERAL STANDARD 595B #15190
8. ALL VINYL CHARACTERS AND SYMBOLS SHALL BE:
   5 3M SCOTCHCAL OPAQUE VINYL MATTE WHITE 3470
8. METAL MATERIALS SHALL BE:
   6 ANODIZED ALUMINUM

18 CHARACTER AND BRAILLE STANDARDS
3" = 1'-0"

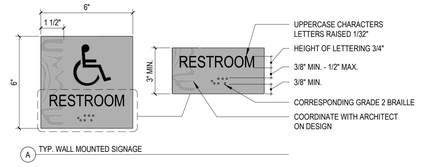


A CHARACTER WIDTH TO HEIGHT PROPORTION TEMPLATE

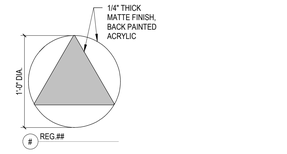


B BRAILLE SPACING TEMPLATE

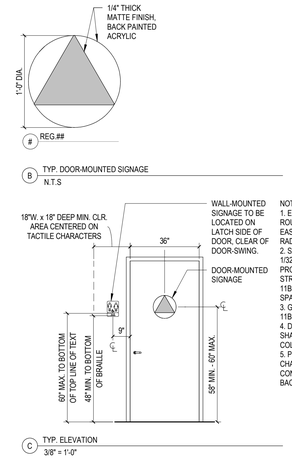
10 CHARACTER & BRAILLE STANDARDS 1
3" = 1'-0"



A TYP. WALL MOUNTED SIGNAGE

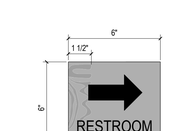


B TYP. DOOR-MOUNTED SIGNAGE
N.T.S



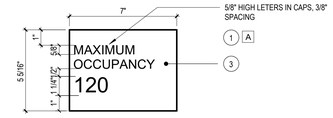
C TYP. ELEVATION
3/8" = 1'-0"

7 REG. 01 - TOILET ROOM SIGNAGE 1
3/8" = 1'-0"



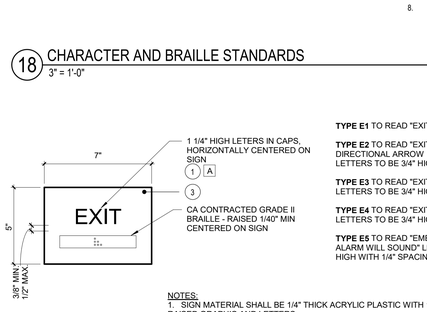
NOTE:
REFER TO DETAIL 7/A852 FOR ADDITIONAL INFORMATION

2 RESTROOM DIRECTIONAL SIGN
3" = 1'-0"



NOTES:
1. SIGN MATERIAL SHALL BE 1/4" THICK ACRYLIC PLASTIC WITH 1/32" RAISED GRAPHIC AND LETTERS.
2. CENTER OF SIGN TO BE MOUNTED AT 5'-0" A.F.F.

3 REG. 04 - OCCUPANT MAX SIGN
3" = 1'-0"



NOTES:
1. SIGN MATERIAL SHALL BE 1/4" THICK ACRYLIC PLASTIC WITH 1/32" RAISED GRAPHIC AND LETTERS. COMPLY WITH ARTICLE 4.30 & A4.30 OF ADAAG.
2. ALL DOORS TO RECEIVE BRAILLE ROOM IDENTIFICATION.
3. REFER TO DETAIL 13 / A852 FOR DOOR SIGNAGE HEIGHT.
4. REFER TO DETAIL 18 / A852 FOR ADDITIONAL NOTES.

20 STAIR SIGNAGE - TYPE S1
3" = 1'-0"

TYPE E1 TO READ "EXIT"

TYPE E2 TO READ "EXIT ROUTE" AND DIRECTIONAL ARROW
LETTERS TO BE 3/4" HIGH WITH 1/4" SPACING

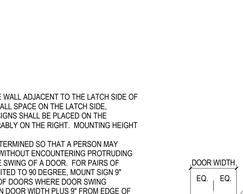
TYPE E3 TO READ "EXIT STAIR DOWN"
LETTERS TO BE 3/4" HIGH WITH 1/4" SPACING

TYPE E4 TO READ "EXIT ONLY"
LETTERS TO BE 3/4" HIGH WITH 1/4" SPACING

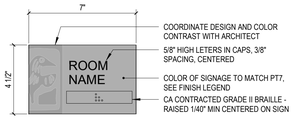
TYPE E5 TO READ "EMERGENCY EXIT ONLY, ALARM WILL SOUND" LETTERS TO BE 3/4" HIGH WITH 1/4" SPACING

NOTES:
1. SIGN MATERIAL SHALL BE 1/4" THICK ACRYLIC PLASTIC WITH 1/32" RAISED GRAPHIC AND LETTERS.
2. PROVIDE AT ALL DOORS WITH SELF ILLUMINATING SIGN.
3. REFER TO DETAIL 13 / A852 FOR DOOR SIGNAGE HEIGHT.
4. REFER TO DETAIL 18 / A852 FOR ADDITIONAL NOTES.

19 REG. 02 - TACTILE EXIT SIGNS
3" = 1'-0"

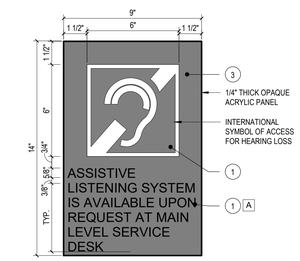


15 ENTRY SIGN - HOURS
3" = 1'-0"

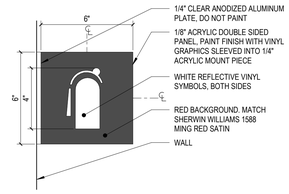


NOTES:
1. SIGN MATERIAL SHALL BE 1/8" THICK ACRYLIC PLASTIC WITH 1/32" RAISED GRAPHIC AND LETTERS.
2. CENTER LINE OF SIGN TO BE MOUNTED AT 5'-0" A.F.F., U.O.N.
3. REFER TO DETAIL 13/A852 FOR ADDITIONAL INFORMATION

11 ID.01 - TYPICAL ROOM SIGN
3" = 1'-0"



8 ASSISTIVE LISTENING SIGN
3" = 1'-0"



NOTES:
1. BOTTOM OF SIGN TO BE MOUNTED AT 7'-0" A.F.F.
2. CENTER ABOVE FIRE EXTINGUISHER CABINET
3. FOR ATTACHMENT SEE

4 REG. 03 - FIRE EXTINGUISHER SIGN
3" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

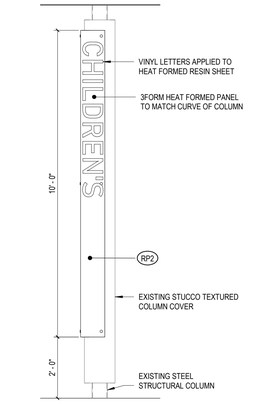
SIGNAGE AND MOUNTING HEIGHTS

SCALE: As indicated

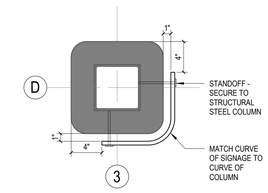
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A852

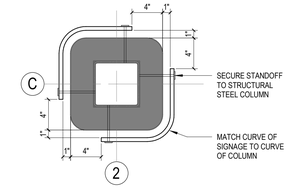
11/7/2024 3:21:21 PM



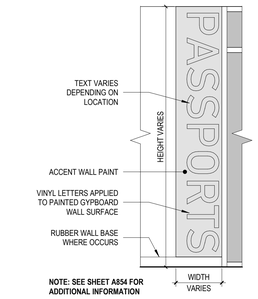
5 ID.04 - SPECIALTY SIGNAGE
1/2" = 1'-0"



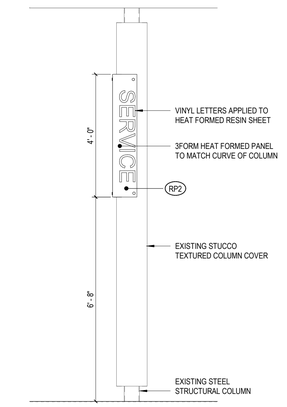
1 COLUMN SIGNAGE ENLARGED PLAN 1
1 1/2" = 1'-0"



2 COLUMN SIGNAGE ENLARGED PLAN 2
1 1/2" = 1'-0"



3 ID.02 - SPECIALTY SIGNAGE
1/2" = 1'-0"



4 ID.03 - SPECIALTY SIGNAGE
1/2" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

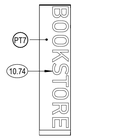
NON-RESTROOM MOUNTING HEIGHTS AND SIGNAGE

SCALE: As indicated

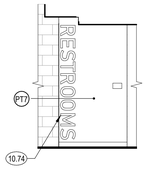
All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A853

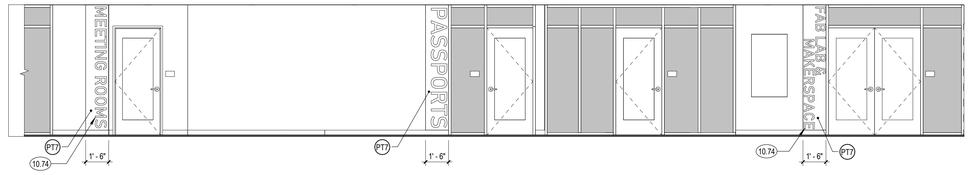
11/7/2024 3:21:24 PM



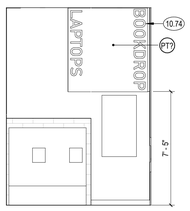
3 SIGNAGE - BOOKSTORE
1/4" = 1'-0"



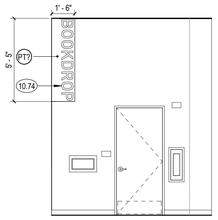
2 SIGNAGE - LOWER LEVEL RR
1/4" = 1'-0"



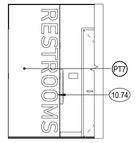
1 SIGNAGE - LOWER LEVEL CORRIDOR
1/4" = 1'-0"



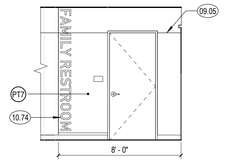
9 SIGNAGE - LAPTOPS
1/4" = 1'-0"



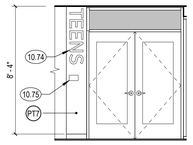
8 SIGNAGE - BOOKDROP
1/4" = 1'-0"



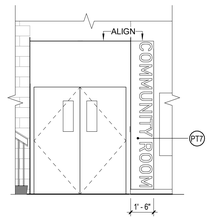
7 SIGNAGE - RESTROOM
1/4" = 1'-0"



6 SIGNAGE - FAMILY RESTROOM
1/4" = 1'-0"



5 SIGNAGE - TEENS
1/4" = 1'-0"



4 SIGNAGE - COMMUNITY ROOM
1/4" = 1'-0"

LEGEND

SHEET NOTES

A. SIGNAGE TEXT SHOWN FOR REFERENCE ONLY. SIGNAGE SUB CONTRACTOR TO COORDINATE WITH ARCHITECT ON TEXT STYLE, FONT, FIT, KERNING, ETC.

B.

C.

KEYNOTES

09.05 1/4" REVEAL
10.74 VINYL LETTERS APPLIED TO PAINTED WALL, COLOR TBD
10.75 TYPICAL ROOM SIGN, SEE SHEET A852

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BACKCHECK #1
BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

STAMP

LICENSED ARCHITECT
MARK SCHOEMAN
No. C-19562
REN. 03-31-25
STATE OF CALIFORNIA

NO.	DATE	REVISIONS
-		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

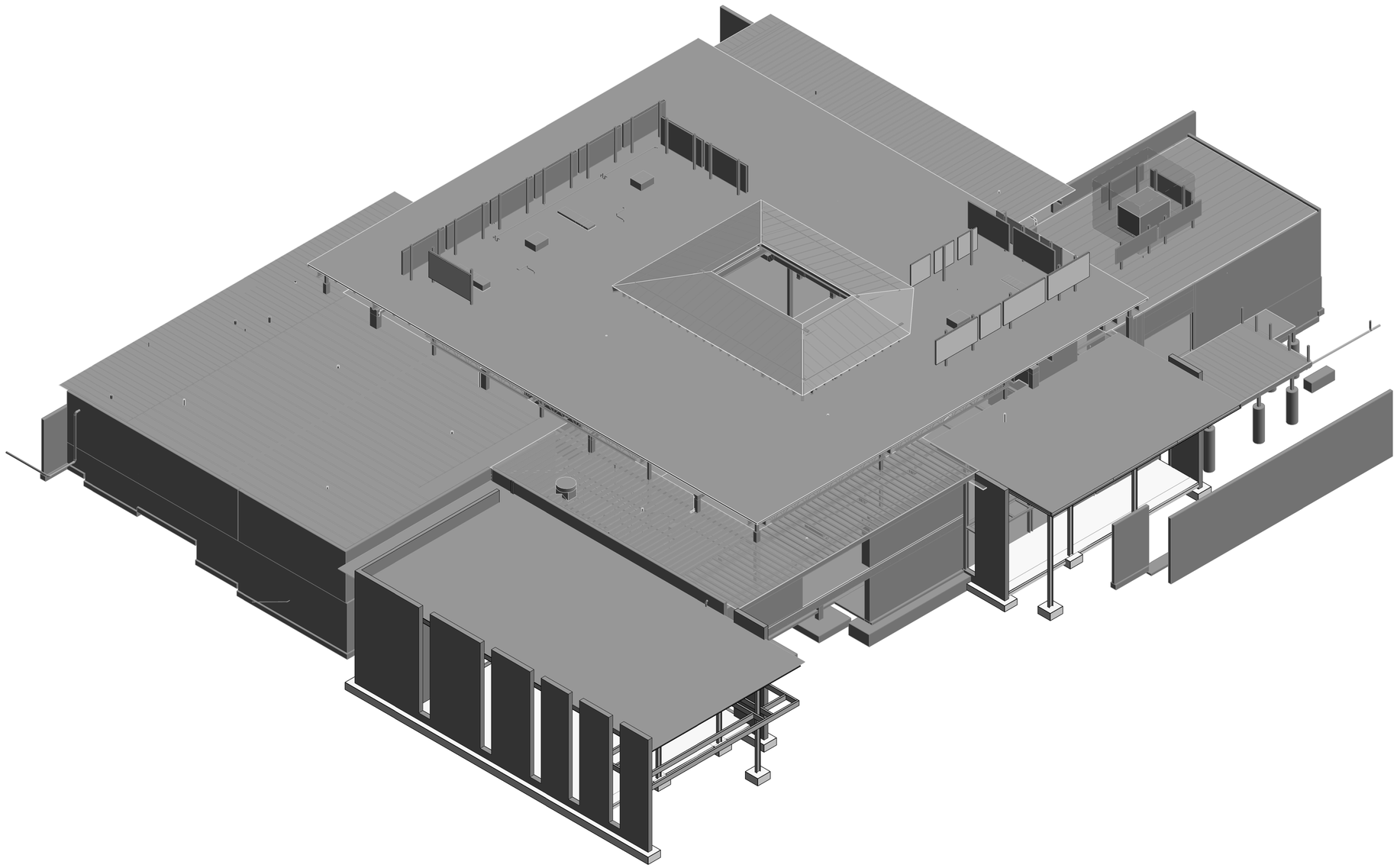
SIGNAGE ELEVATIONS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

A854

11/7/2024 3:21:28 PM



ISOMETRIC VIEW

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M02208001.00 - v20

T: (909) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — TRAVIS C. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

ISOMETRIC VIEW

SCALE:

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

S0.00

11/6/2024 4:38:19 PM

STRUCTURAL SUBMITTALS

010000-0008

1. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND- OR SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND- OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTION.

2. THE FOLLOWING LIST SUMMARIZES REQUIRED STRUCTURAL SUBMITTALS FOR THIS PROJECT. REFER TO THE SPECIFICATIONS FOR A COMPLETE LIST AND ADDITIONAL REQUIREMENTS.

GENERAL
- QUALIFICATION DATA FOR APPROVED INSTALLERS AND FABRICATORS
- CERTIFICATES OF CONFORMANCE FOR PREFABRICATED MEMBERS
- SEISMIC JOINT AND EXPANSION JOINT COVER PRODUCT DATA

CONCRETE REINFORCEMENT
- MANUFACTURER'S PRODUCT DATA, SPECIFICATIONS AND INSTALLATION PROCEDURES FOR PROPRIETARY MATERIALS AND REINFORCEMENT
- STEEL PRODUCER'S CERTIFICATES OF MILL ANALYSIS, TENSILE AND BEND TESTS
- SHOP DRAWINGS FOR FABRICATION, BENDING AND PLACEMENT

CAST-IN-PLACE CONCRETE
- DESIGN MIX FOR EACH CONCRETE MIX
- MATERIAL TEST REPORTS
- MATERIAL CERTIFICATES FOR CEMENT, AGGREGATES AND ADMIXTURES
- SHOP DRAWINGS FOR FORMWORK LOCATIONS OF ADDITIONAL CONSTRUCTION OR CONTROL JOINTS NOT SHOWN ON THE STRUCTURAL PLANS
- MINUTES FROM PREINSTALLATION CONFERENCE

UNIT MASONRY
- DESIGN MIX FOR GROUT
- MATERIAL TEST REPORTS

STRUCTURAL STEEL
- MANUFACTURER'S MILL CERTIFICATES
- MILL TEST REPORTS
- SHOP DRAWINGS FOR FABRICATION AND ASSEMBLY OF MEMBERS
- ERECTION PLAN SEQUENCE AND PROCEDURES
- WELDING PROCEDURE SPECIFICATIONS (WPS)
- CERTIFICATES FOR ALL WELDERS VERIFYING CURRENT AWS QUALIFICATIONS
- TEST REPORTS FOR SHOP AND FIELD WELDED AND BOLTED CONNECTIONS

ROUGH CARPENTRY
- PRODUCT DATA FOR TREATMENTS AND PRESERVATIVES
- MATERIAL CERTIFICATES FOR DIMENSION LUMBER

DEFERRED APPROVALS

010000-0005

WHERE DEFERRED APPROVAL ITEMS ARE DESIGN-BUILD (OR BIDDER-DESIGNED), THE CONTRACTOR SHALL SUBMIT DRAWINGS AND CALCULATIONS STAMPED AND SIGNED BY A CIVIL ENGINEER LICENSED IN THE STATE OF CALIFORNIA. SUBMITTAL DOCUMENTS FOR THE FOLLOWING DEFERRED APPROVAL ITEMS SHALL BE REVIEWED BY THE ARCHITECT OR SEOR AND THEN SUBSEQUENTLY REVIEWED AND APPROVED BY THE BUILDING OFFICIAL PRIOR TO INSTALLATION:

1. METAL STAIRS
2. ELEVATORS

EXISTING CONDITIONS

010000-0001

1. "AS BUILT" DRAWINGS FOR EXISTING BUILDING ARE NOT AVAILABLE.

2. FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO SHOP DRAWING PRODUCTION AND FABRICATION OF STRUCTURAL ELEMENTS.

3. WHERE EXISTING CONDITIONS VARY FROM THOSE SHOWN ON THESE DRAWINGS, THE STRUCTURAL ENGINEER SHALL BE NOTIFIED PRIOR TO CONTINUED CONSTRUCTION RELATED TO SUBJECT CONDITIONS.

4. SHORE ALL EXISTING CONSTRUCTION AS REQUIRED, INCLUDING WHERE WELDING TO EXISTING STEEL FRAMING. SHORING DESIGN IS BY OTHERS.

5. ALL EXISTING CONCRETE SURFACES TO BE IN CONTACT WITH NEW CONCRETE SHALL BE CLEANED AND ROUGHENED TO 1/4" MINIMUM AMPLITUDE. USE BONDING AGENT BY SIKA OR APPROVED EQUIVALENT ON EXISTING CONCRETE PRIOR TO PLACING NEW CONCRETE. PREPARE SURFACE AND APPLY IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

6. VERIFY LOCATION OF EXISTING REBAR BEFORE FABRICATION USING NON-DESTRUCTIVE TESTING. DO NOT DAMAGE EXISTING REBAR.

7. THE GENERAL CONTRACTOR SHALL COORDINATE THE WEIGHT AND SPECIFIC LOCATION OF ALL EQUIPMENT WITH THE STRUCTURAL FRAMING. IF THE EQUIPMENT DEVIATES IN WEIGHT OR LOCATION FROM THOSE INDICATED IN THE DRAWINGS, THE STRUCTURAL ENGINEER'S APPROVAL MUST BE OBTAINED PRIOR TO INSTALLATION OF THE UNITS.

8. ALL EXISTING WOOD FRAMING MEMBERS SUPPORTING NEW MECHANICAL UNITS SHALL BE INSPECTED FOR DAMAGE AND DETERIORATION PRIOR TO INSTALLATION OF THE UNITS. NOTIFY THE STRUCTURAL ENGINEER IF DAMAGE OR DETERIORATION IS DISCOVERED.

LA DBS — Los Angeles Regional Uniform Code Program
DEPARTMENT OF BUILDING AND SAFETY
Committee I-3: Structural Observation

STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER

PROJECT ADDRESS: 600 E Mariposa Street PERMIT APPL. NO.:
Description of Work: Voluntary Seismic Upgrade and Modernization
Owner: Architect: ABA Engineer: Miyamoto Int'l

STRUCTURAL OBSERVATION
(only checked items are required)

Firm or Individual to be responsible for the Structural Observation:
Name: Phone: ( ) Calif. Registration:

FOUNDATION	WALL	FRAME	DIAPHRAGM
☑ Footing, Stem Walls, Piers	☑ Concrete	☑ Steel Moment Frame	☐ Concrete
☐ Mat Foundation	☑ Masonry	☐ Steel Braced Frame	☑ Steel Deck
☐ Caisson, Piles, Grade Beams	☑ Wood	☐ Concrete Moment Frame	☑ Wood
☐ Step'g/Retain'g Foundation, Hillside Special Anchors	☐ Others:	☐ Others:	☐ Others:
☐ Others:			

DECLARATION BY OWNER

I, the Owner of the project, declare that the above listed firm or individual is hired **by me** to be the Structural Observer.

Signature Date

DECLARATION BY ARCHITECT OR ENGINEER OF RECORD (required if the Structural Observer is different from the Architect or Engineer of Record)

I, the Architect or Engineer of record for the project, declare that the above listed firm or individual is designated by me to be responsible for the Structural Observation.

Traci Wong C69886 11/6/2024
Signature License No. Date

INFform-56 (Part 2) (Rev. 06/19/17)

PRODUCT REPORTS

010000-0006

1. FOR ALL ITEMS IN THE CONSTRUCTION DOCUMENTS NOT NOTED WITH A SPECIFIC PRODUCT NAME OR MANUFACTURER, THE CONTRACTOR SHALL PROVIDE A PRODUCT SPECIFIED IN THE TABLE BELOW.
2. THE FOLLOWING PRODUCTS SHALL BE INSTALLED PER THE REQUIREMENTS OF THE REFERENCED PRODUCT REPORTS, UNO.
3. A PRODUCT MAY BE SUBSTITUTED FOR AN EQUIVALENT PRODUCT PER THE SCHEDULE BELOW IF APPROVED BY THE SEOR AND THE BUILDING OFFICIAL.
4. PRODUCTS SPECIFIED BY TYPE ONLY MAY USE ANY PRODUCT FROM THE SCHEDULE BELOW.

TYPE	PRODUCT	ICC#	IAPMO#	LARR#
EXPANSION ANCHOR TO CONCRETE	HILTI KWIK BOLT TZ	ESR-1917	-	25701
	HILTI KWIK BOLT TZ2	ESR-4266	-	-
	HILTI KWIK BOLT 1	-	0678	-
	MKT SZ	ESR-3173	-	-
	SIMPSON STRONG-BOLT 2	ESR-3037	-	25891
	DEWALT POWER STUD+ SD1	ESR-2818	-	25787
	DEWALT POWER STUD+ SD2/SD4/SD6	ESR-2502	-	25831
ADHESIVE ANCHOR TO CONCRETE	HILTI HIT-HY 200	ESR-3187	-	25964
	HILTI HIT-HY 200 V3	ESR-4868	-	-
	HILTI HIT-RE 500 V3	ESR-3814	-	26028
	HILTI HIT-RE 100	ESR-3829	-	26027
	HILTI HIT-HY-100	ESR-3572	-	-
	SIMPSON SET-3G	ESR-4057	-	-
	SIMPSON SET-XP	ESR-2508	-	-
	SIMPSON AT-XP	-	0263	-
	DEWALT PE1000+	ESR-2583	-	25849
	DEWALT AC200+	ESR-4027	-	-
	DEWALT PURE 110+	ESR-3298	-	26035
SCREW ANCHOR TO CONCRETE	HILTI KWIK HUS-EZ	ESR-3027	-	25897
	SIMPSON TITEN HD	ESR-2713	-	-
	SIMPSON SS TITEN SCREW	-	0493	26125
	DEWALT SCREWBOLT+	ESR-3889	-	-
DROP-IN ANCHOR TO CONCRETE	DEWALT SNAKE+	ESR-2272	-	25810
UNDERCUT ANCHORS TO CONCRETE	HILTI HDA	ESR-1546	-	25939
	DEWALT ATOMIC+	ESR-3067	-	-
	DEWALT MINI-UNDERCUT+	ESR-3912	-	-
CAST-IN INTERNALLY THREADED	HILTI HCI-HDHCI-WF	ESR-3713	-	26024
	ISAT BLUE BANGER HANGER	ESR-3599	-	26030
	DEWALT BANG-IT / WOOD KNOCKER	ESR-3657	-	-
CONCRETE SCREW	SIMPSON SS TITEN 2	-	0449	-
	ITW BUILDEX TAPCON	ESR-2202	-	-
	DEWALT ULTRACON+	ESR-3068	-	-
	SIMPSON TITEN TURBO (TNT)	-	0712	-
SHOTPIN (POWER DRIVEN FASTENER) ***	HILTI LOW-VELOCITY	ESR-2269	-	25675
	ITW / RAMSET/LOWER-DRIVEN	ESR-1799	-	22668
	SIMPSON POWER-ACTUATED PDPA	ESR-2138	-	25469
	DEWALT TRACK-IT C5	ESR-3275	-	25920
	DEWALT POWER-DRIVEN	ESR-2024	-	25304
CONCRETE REINFORCING HEADED END *	HRC 555 HEADED BARS	ESR-2935	0177	25815
	LENTON TERMINATOR D14	-	0188	25893
	BAR SPLICE BUTTON HEAD	-	0331	25996
	DEXTRA BARTEC	ESR-2166	-	25884
CONCRETE REINFORCING MECHANICAL SPLICES	HRC 500 COUPLERS	ESR-2764	-	25347
	LENTON THREADED COUPLERS	-	0129	24507
	BAR SPLICE ZAP SCREWLOK TYPE 2	ESR-3517	-	25366
	BAR SPLICE BPI-GRIP XL	ESR-2299	-	25011
	DEXTRA BARTEC	ESR-1705	-	25615
	DAYTON SUPERIOR BAR-LOCK	ESR-2495	-	25342
FORM MOUNTED REINF COUPLER	DEXTRA BARTEC	ESR-1705	-	25615
	LENTON THREADED FORM SAVERS	-	0129	24507
EXPANSION ANCHOR TO GROUTED MASONRY	HILTI KWIK BOLT 3	ESR-1385	-	25577M
	HILTI KWIK BOLT TZ	ESR-3785	-	26057
	HILTI KWIK BOLT TZ2	ESR-4561	-	-
	HILTI KWIK BOLT 1	-	0677	-
	SIMPSON STRONG-BOLT 2	-	0240	25936
	DEWALT POWER STUD+ SD1	ESR-2966	-	25864
ADHESIVE ANCHOR TO GROUTED MASONRY	HILTI HIT-HY 270	ESR-4143	-	-
	HILTI HIT-HY-200 V3	ESR-4878	-	26077
	SIMPSON SET	-	-	25279
	SIMPSON SET-XP	-	0265	25965
	SIMPSON AT-XP	-	0281	25966
	DEWALT AC100+ GOLD	ESR-3200	-	26049
SCREW ANCHOR TO GROUTED MASONRY	HILTI KWIK HUS-EZ	ESR-3056	-	25979
	SIMPSON TITEN HD	ESR-1056	-	25560
	DEWALT SCREWBOLT+	ESR-4042	-	-
	SIMPSON TITEN TURBO (TNT)	-	0712	-
MASONRY SCREW	DEWALT ULTRACON+	ESR-3196	-	-
	HILTI HIT-HY 270	ESR-4144	-	-
ADHESIVE ANCHOR TO BRICK	SIMPSON SET	ESR-1772	-	25279
	SIMPSON ET-HP	ESR-3638	-	-
	DEWALT AC100+ GOLD	ESR-4105	-	-
WELDED STUDS	NELSON STUDS	ESR-2856	-	02725
	STUD WELDING ASSOCIATES SHEAR CONNECTOR STUDS	ESR-1094	-	-
	TRU-WELD HEADED STUD ANCHORS	ESR-2577	-	24330
WELDED BAR ANCHORS	NELSON DEFORMED BAR ANCHORS	ESR-2907	-	25860
	TRU-WELD DEFORMED BAR ANCHORS	ESR-2823	-	25887
METAL DECK	VERCO DECK	-	0217	23789
	ASC STEEL ROOF DECK	ESR-1414	-	23783
	ASC STEEL FLOOR DECK	ESR-2408	-	23783
	EPIC METALS EPICORE	ESR-2047	-	25487
	CONSOLIDATED SYSTEMS ROOF DECK	ESR-2657	-	25758
	CONSOLIDATED SYSTEMS FLOOR DECK	ESR-2839	-	-
CONCRETE SLAB STUD RAILS	DECON STUD RAILS	ESR-2494	-	25395
	PEIKKO DSA/SSA SHEAR RAILS	ESR-3904	-	-
	TRU-WELD SHEAR RESISTOR STUDS	ESR-2822	-	25941
	PJ'S PUNCHING SHEAR RESISTORS	ESR-3821	-	26070
	NELSON PUNCHING SHEAR RESISTORS	ESR-1170	-	25499
	JSW STUD RAILS	ESR-3264	-	25930
SHEET METAL SCREW **	HILTI KWIK-PRO	ESR-2196	-	25678
	HILTI KWIK-FLEX	ESR-3332	-	25095
	SIMPSON X METAL SCREWS	ESR-3006	0326	25917
	PRIMESOURCE DARTS	ESR-1408	-	25904
	ITW BUILDEX TEKS	ESR-1976	-	25915
	ELCO DRIL-FLEX	ESR-3332	-	25095
BLIND FASTENERS TO STEEL	LNA BOXBOLT TYPE C	ESR-3217	-	-
	HOLO-BOLT 3 PART / 5 PART	ESR-3330	-	26037
WOOD FRAMING CLIPS	SIMPSON STRONG-TIE CLIPS	ESR-2523	-	-
	USP STRUCTURAL CONNECTORS	ESR-2685	-	-
WOOD SCREWS	SIMPSON STRONG DRIVE SCREWS (SDS)	ESR-2236	-	25711
	SIMPSON SD TIMBER SCREWS (SDWS/SDWH)	-	0192	25906
	FASTENMASTER TIMBERLOK / HEADLOK / LEDGERLOK	ESR-1078	-	-

FOOTNOTES:
* ANY CONCRETE REINFORCING HEADED END COMPLYING WITH ASTM A970 MAY BE USED.
** ANY SHEET METAL SCREW COMPLYING WITH ASTM C1513, SELF-DRILLING AND TAPPING TYPE, WITH HEAD TYPE APPROPRIATE TO THE APPLICATION, MAY BE USED.
*** AT TREATED LUMBER, PROVIDE GALVANIZED FASTENERS IN ACCORDANCE WITH PRODUCT REPORTS.

STATEMENT OF SPECIAL INSPECTION CONT

COLD-FORMED STEEL FRAMING

PERIODIC: SCREW ATTACHMENT, BOLTING, AND ANCHORING OF STRAPS, HOLDOWNS, BRACES, DRAG STRUTS, ROOF, WALLS AND FLOORS

NON-STRUCTURAL COMPONENTS

PERIODIC: ERECTION AND FASTENING OF EXTERIOR CLADDING, INTERIOR AND EXTERIOR NONBEARING WALLS, AND INTERIOR AND EXTERIOR VENEER GREATER THAN 30' HEIGHTS. EXTERIOR WALLS GREATER THAN 5 PSF, AND INTERIOR WALLS MORE THAN 15 PSF

PERIODIC: ANCHORAGE OF ELECTRICAL EQUIPMENT

PERIODIC: ANCHORAGE OF SUSPENDED CEILING SYSTEMS

PERIODIC: ANCHORAGE OF HVAC DUCTWORK THAT WILL CONTAIN HAZARDOUS MATERIALS

PERIODIC: ANCHORAGE OF PIPING SYSTEMS AND MECHANICAL UNITS THAT WILL CONTAIN FLAMMABLE, COMBUSTIBLE, OR HIGHLY TOXIC MATERIALS

PERIODIC: ANCHORAGE OF ACCESS FLOORS AND ANCHORAGE OF STORAGE RACKS 8 FEET OR GREATER IN HEIGHT

PERIODIC: FLEXIBLE CONNECTIONS OF UTILITIES CROSSING EXPANSION OR SEISMIC JOINTS

STRUCTURAL OBSERVATIONS

010000-0007

1. VISUAL OBSERVATIONS WILL BE PERFORMED AT THE DISCRETION OF THE OWNER, ARCHITECT, SEOR, AND AS REQUIRED BY THE BUILDING OFFICIAL IN ACCORDANCE WITH THE BUILDING CODE. VISUAL OBSERVATIONS SHALL NOT BE CONSIDERED AS A SUBSTITUTE FOR THE SPECIAL INSPECTION REQUIREMENTS.

2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY THE SEOR AS TO WHEN EACH MAJOR PHASE OF CONSTRUCTION IS READY FOR OBSERVATION A MINIMUM OF FIVE BUSINESS DAYS IN ADVANCE.

3. THE FOLLOWING MAJOR PHASES OF CONSTRUCTION REQUIRE A SITE VISIT AND STRUCTURAL OBSERVATION REPORT FROM THE SEOR:
   a. FOUNDATION REBAR AND ANCHORS - PRIOR TO FIRST POUR OF CONCRETE
   b. CONCRETE SHEAR WALL REINFORCING AND EPOXY DOWELS - PRIOR TO SHOTCRETE APPLICATION
   c. NEW FLOOR FRAMING PRIOR TO CLOSING IN.
   d. NEW ROOF FRAMING PRIOR TO CLOSING IN.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT NAILING, REINFORCEMENT, WELDS, CONNECTIONS, ETC. ARE VISIBLE FOR OBSERVATION WHEN THE SEOR IS ONSITE AND FOR ANY SCHEDULING DELAYS DUE TO NONCOMPLIANT ITEMS FOUND DURING THE OBSERVATION.

5. AT THE CONCLUSION OF THE WORK INCLUDED IN THE PERMIT, THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING OFFICIAL A WRITTEN STATEMENT THAT THE SITE VISITS HAVE BEEN MADE AND IDENTIFY ANY REPORTED DEFICIENCIES THAT, TO THE BEST OF THE STRUCTURAL OBSERVERS' KNOWLEDGE, HAVE NOT BEEN RESOLVED.

REFERENCE OF SECTIONS, DETAILS & SYMBOLS

010000-0004

DETAIL REFERENCE SHOWN THUS *:
2 / S5.01 **

DETAIL NOTED IS SHOWN ON SHEET S5.01, DETAIL 2

BUILDING SECTION INDICATION SHOWN THUS:
2 / S5.01 **

CUT IS SHOWN ON SHEET S5.01, DETAIL 2

ELEVATION INDICATION SHOWN THUS:
2 / S5.01 **

ELEVATION IS SHOWN ON SHEET S5.01, DETAIL 2

* (ADDITIONAL INDICATORS MAY BE USED TO SHOW LOCATION OF DETAIL CUTS)
** (SHEET NUMBER MAY BE REPLACED BY A HYPHEN (-) WHEN THE REFERENCED DETAIL APPEARS ON THE SAME SHEET AS THE CALL-OUT)

DETAIL TITLE SHOWN THUS:

2 DETAIL TITLE
SCALE

INDICATES THE TITLE, SCALE, AND DETAIL NUMBER ON SHEET

CONCRETE MASONRY

042000-0001

1. CONCRETE MASONRY UNITS (CMU) SHALL DEVELOP THE FOLLOWING MINIMUM 28 DAY PRISM COMPRESSIVE STRENGTHS:

LOCATION	f'm	CONCRETE MASONRY UNITS	GROUT
ALL CMU, UNO	2000 PSI	2000 PSI	2000 PSI

2. CONCRETE BLOCK SHALL CONFORM TO ASTM C90 MEDIUMWEIGHT. USE OF LIGHTWEIGHT BLOCK REQUIRES PRIOR WRITTEN APPROVAL BY THE SEOR.

3. MORTAR SHALL BE TYPE S MORTAR.

4. VERTICAL REINFORCING SHALL BE FULL HEIGHT OF WALL AND SHALL BE BRACED AT 6'-8" MAXIMUM TO PREVENT MOVEMENT WHILE GROUTING.

5. HORIZONTAL REINFORCING SHALL BE IN BOND BEAM UNITS AND TIED SECURELY TO VERTICAL REINFORCING.

6. DOWELS, ANCHORS, AND OTHER EMBEDDED ITEMS SHALL BE TIED SECURELY IN PLACE TO PREVENT MOVEMENT WHILE GROUTING. WET SETTING OR STABBING IS NOT ALLOWED.

7. LAYOUT OF MASONRY BLOCK UNITS SHALL BE PER ARCHITECTURAL DRAWINGS. BLOCK MODULES / MORTAR JOINTS SHOWN ON THESE DRAWINGS ARE FOR PRESENTATION PURPOSES ONLY, AND NOT INTENDED TO SUPERCEDE ARCHITECTURAL DESIGN REQUIREMENTS. BLOCK SHALL BE PLACED IN RUNNING BOND AND SHALL BE 8x8x16 NOMINAL UNITS, UNO. WHERE BLOCK IS REQUIRED TO BE PLACED IN STACK BOND (SEE ARCH), OPEN-ENDED UNITS (I.E., "SPEED BLOCK") SHALL BE USED.

8. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE SAFETY OF LIFT HEIGHT FOR OPEN-ENDED OR FIELD MODIFIED BLOCKS.

9. REINFORCING 8" BLOCK:

TYPICAL VERTICAL REINFORCING	#5 @ 16"OC, CENTERED, UNO
TYPICAL HORIZONTAL REINFORCING	#4 @ 24"OC, UNO

10. PROVIDE VERTICAL CONTROL JOINTS IN CMU WALLS AS SHOWN ON PLAN. UNLESS NOTED OTHERWISE, VERTICAL CONTROL JOINTS SHALL OCCUR AT:
    a. 25'-0"OC MAXIMUM ALONG LENGTH OF WALL
    b. A SPACING NOT EXCEEDING 1.5 TIMES THE WALL HEIGHT
    c. CHANGES IN WALL HEIGHT
    d. CHANGES IN WALL THICKNESS
    e. FLOOR AND ROOF JOINTS
    f. 24" PAST ONE SIDE OF OPENINGS LESS THAN 6'-0" WIDE
    g. 24" PAST BOTH SIDES OF OPENINGS GREATER THAN OR EQUAL TO 6'-0" WIDE
    h. CORNERS AND INTERSECTIONS, WITHIN A DISTANCE EQUAL TO HALF THE CONTROL JOINT SPACING

11. FILL ALL CELLS WITH GROUT. MAXIMUM GROUT LIFTS SHALL NOT EXCEED 8'-0" AND CLEANOUTS AT THE BOTTOM OF ALL CELLS SHALL BE USED UNLESS THE LIFT IS 4'-0" OR LESS. GROUT FOR EACH POUR SHALL BE STOPPED 1 1/2" BELOW THE TOP OF A BLOCK COURSE EXCEPT AT THE FINAL COURSE. ALL GROUT SHALL BE THOROUGHY CONSOLIDATED BY VIBRATING IMMEDIATELY AFTER PLACING. SHAKING OR RODDING REBAR IS NOT ALLOWED. HORIZONTAL REINFORCING SHALL BE FULLY EMBEDDED IN GROUT IN AN UNINTERRUPTED POUR.

12. (DSA) FILL ALL CELLS WITH GROUT. LIFTS SHALL BE 4'-0" MAX UNLESS HIGH-LIFT GROUTING IS USED. GROUT FOR EACH POUR SHALL BE STOPPED 1 1/2" BELOW TOP OF BLOCK EXCEPT AT THE FINAL COURSE. ALL GROUT SHALL BE THOROUGHLY CONSOLIDATED BY VIBRATING IMMEDIATELY AFTER PLACING. HORIZONTAL REINFORCING SHALL BE FULLY EMBEDDED IN GROUT IN AN UNINTERRUPTED POUR. DSA APPROVAL IS REQUIRED FOR HIGH-LIFT GROUTING. ALL HIGH-LIFT GROUTING SHALL CONFORM TO DSA IR 21-2 AND CBC 2019 SECTION 2104A.1.3.1.1.1.2

STATEMENT OF SPECIAL INSPECTION

010000-0003

1. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING CONSTRUCTION. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

2. SPECIAL INSPECTIONS ARE NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVED FABRICATORS MUST SUBMIT A CERTIFICATE OF COMPLIANCE FOR OFFSITE FABRICATIONS SUCH AS STRUCTURAL STEEL, PRECAST CONCRETE, GLUED LAMINATED TIMBER, ETC.

3. ALL INSPECTIONS SHALL BE PERFORMED BY INDEPENDENT SPECIAL INSPECTORS. JOB SITE VISITS BY THE STRUCTURAL ENGINEER OF BUILDING OFFICIAL DO NOT CONSTITUTE AND ARE NOT A SUBSTITUTE FOR INSPECTIONS BY A SPECIAL INSPECTOR.

4. ALL INSPECTION REPORTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL AND SEOR. THE FINAL REPORTS BY THE SPECIAL INSPECTOR(S) MUST CERTIFY THAT THE STRUCTURAL SYSTEM COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS.

5. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT THESE INSPECTIONS ARE PERFORMED.

6. WORK REQUIRING SPECIAL INSPECTION SHALL BE INSPECTED BY THE SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS PERFORMED AND AT THE COMPLETION OF WORK. CONTINUOUS (CONT) INSPECTION CONSISTS OF FULL-TIME INSPECTION; PERIODIC (PERIODIC) INSPECTION CONSISTS OF PART-TIME OR INTERMITTENT INSPECTION.

7. AT A MINIMUM, ALL SPECIAL INSPECTIONS REQUIRED BY THE BUILDING CODE SHALL BE PROVIDED. THE FOLLOWING SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE BUILDING OFFICIAL. THIS LIST IS NOT INTENDED TO BE ALL INCLUSIVE.

SOILS SUPPORTING FOUNDATIONS

PERIODIC: VERIFY MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY

PERIODIC: VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL

PERIODIC: PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS

CONT: VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF CONTROLLED FILLS

PERIODIC: PRIOR TO PLACEMENT OF CONTROLLED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY

STRUCTURAL CONCRETE

PERIODIC: INSPECTION OF REINFORCING STEEL AND PLACEMENT

CONT: INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE

PERIODIC: VERIFY USE OF REQUIRED DESIGN MIX

CONT: SAMPLING FRESH CONCRETE AND PERFORMING SLUMP AND AIR CONTENT TESTS, AND DETERMINING THE TEMPERATURE OF FRESH CONCRETE AT THE TIME OF MAKING SPECIMENS FOR STRENGTH TESTS

CONT: INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES

PERIODIC: INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUE

PERIODIC: VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS

PERIODIC: INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED

PERIODIC: ERECTION OF PRECAST CONCRETE MEMBERS

PERIODIC: POST-INSTALLED AND ADHESIVE ANCHORS

STRUCTURAL STEEL

PERIODIC: HIGH-STRENGTH BOLTS, NUTS, AND WASHERS IDENTIFICATION MARKINGS TO CONFORM TO SPECIFIED ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS

PERIODIC: HIGH-STRENGTH BOLT BEARING-TYPE CONNECTIONS

CONT: SLIP-CRITICAL CONNECTIONS USING TURN-OF-NUT METHOD WITH MATCHMARKING, DIRECT TENSION INDICATOR METHOD, OR TWIST OFF BOLTS

PERIODIC: SLIP-CRITICAL CONNECTIONS USING CALIBRATED WRENCH METHOD OR TURN-OF-NUT WITHOUT MATCHMARKING

PERIODIC: STRUCTURAL STEEL IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS

PERIODIC: STRUCTURAL STEEL MANUFACTURER'S CERTIFIED MILL TEST REPORTS

PERIODIC: STEEL FRAME BRACING AND STIFFENER DETAILS FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS

PERIODIC: STEEL FRAME MEMBER LOCATIONS

PERIODIC: APPLICATIONS OF JOINT DETAILS AT EACH CONNECTION

REFER TO AISC 360 CHAPTER N FOR MORE INFORMATION ON REQUIRED INSPECTIONS RELATED TO STEEL CONSTRUCTION.

WELDING

CONT: COMPLETE AND PARTIAL PENETRATION GROOVE WELDS

CONT: FILLET WELDS > 5/16" AND MULTIPASS FILLET WELDS

PERIODIC: FILLET WELDS < 5/16"

PERIODIC: METAL DECK WELDS

PERIODIC: LIGHT GAUGE METAL WELDS

PERIODIC: WELD FILLER MATERIAL IDENTIFICATION MARKINGS TO CONFORM TO AWS STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS, MANUFACTURER'S CERTIFICATION OF COMPLIANCE REQUIRED

CONT: WELDING OF REINFORCING STEEL RESISTING SEISMIC FORCES, INDICATED ON PLANS AND DETAILS AS LFRS ELEMENTS OR CONNECTIONS

PERIODIC: VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A706

CONT: WELDING OF STIRRUPS, HOOPS OR TIES

CONT: REINFORCING STEEL WELDS IN CMU

PERIODIC: ALL OTHER REINFORCING STEEL WELDS, UNO

ROUGH CARPENTRY / WOOD

PERIODIC: HIGH LOAD DIAPHRAGMS WITH MULTIPLE ROWS OF FASTENERS: VERIFY PANEL GRADE, THICKNESS, NOMINAL FRAMING SIZES AND FASTENERS

PERIODIC: SHEAR WALL AND DIAPHRAGM NAILING, BOLTING, ANCHORING AND OTHER FASTENING WHERE FASTENER SPACING IS 4 INCHES ON CENTER OR LESS

CONCRETE MASONRY - LEVEL B (RISK CATEGORY I, II OR III)

PERIODIC: VERIFY COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS

PERIODIC: PROPORTIONS OF SITE-PREPARED MORTAR AND SITE-PREPARED GROUT

PERIODIC: PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS

PERIODIC: GRADE, TYPE, AND SIZE OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS

PERIODIC: LOCATION AND PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS

PERIODIC: GROUT SPACE PRIOR TO GROUTING

PERIODIC: SIZE AND LOCATON OF STRUCTURAL ELEMENTS

PERIODIC: OBSERVE PREPARATION OF GROUT AND MORTAR SPECIMENS AND/OR PRISMS

PERIODIC: VERIFICATION OF TYPE, SIZE, AND LOCATION OF ANCHORS OR EMBEDDED STRUCTURAL ELEMENTS INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION

PERIODIC: OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS

PERIODIC: PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING WEATHER BELOW 40°F OR WEATHER ABOVE 90°F

PERIODIC: POST-INSTALLED ANCHORS AND POST-INSTALLED REINFORCEMENT

SHOTCRETE (COMPONENT OF LATERAL FORCE RESISTING SYS

ABBREVIATIONS AND LEGEND

010000-0002

AB	ANCHOR BOLT	INT	INTERIOR
ABV	ABOVE	IOR	INSPECTOR OF RECORD
ADDL	ADDITIONAL	JST	JOIST
ADJ	ADJACENT	JT	JOINT
AFF	ABOVE FINISH FLOOR	KLF	KIPS PER LINEAR FOOT
ALT	ALTERNATE	KSF	KIPS PER SQUARE FOOT
ARCH	ARCHITECT(URAL)	KSI	KIPS PER SQUARE INCH
BLDG	BUILDING	L	ANGLE
BLK	BLOCK	LD	DEVELOPMENT LENGTH
BLKG	BLOCKING	LDH	HOOK DEVELOPMENT LENGTH
BLW	BELOW	LFRS	LATERAL FORCE RESISTING SYSTEM
BM	BEAM		
BN	BOUNDARY NAILING	LLH	LONG LEG HORIZONTAL
B.O.	BOTTOM OF	LLV	LONG LEG VERTICAL
BOTT	BOTTOM	LONG	LONGITUDINAL
BRB	BUCKLING-RESTRAINED BRACE	LP	LOW POINT
BRG	BEARING	LS	LAP SPLICE
BS	BOTH SIDES	LWC	LIGHTWEIGHT CONCRETE
BTWN	BETWEEN	MAX	MAXIMUM
C	CAMBER	MB	MACHINE BOLT
CG	CENTER OF GRAVITY	MECH	MECHANICAL
CIP	CAST IN PLACE	MFR	MANUFACTURER
CJ	CONTROL/CONSTRUCTION JOINT	MIN	MINIMUM
CJP	COMPLETE JOINT PENETRATION	MTL	METAL
CL	CENTERLINE	(N)	NEW
CLG	CEILING	NA	NEUTRAL AXIS
CLR	CLEAR	NS	NEAR SIDE OR NON-SHRINK
CMU	CONCRETE MASONRY UNIT	NTS	NOT TO SCALE
COL	COLUMN	NWC	NORMALWEIGHT CONCRETE
CONC	CONCRETE	OC	ON CENTER
CONN	CONNECTION	OD	OUTSIDE DIAMETER
CONT	CONTINUOUS	O.F.	OUTSIDE FACE
CSK	COUNTERSINK, COUNTERSUNK	OH	OPPOSITE HAND
CTR(D)	CENTER(ED)	OPNG	OPENING
D_B DB	BAR DIAMETER OR BOLT DIAMETER	PDF	POWDER/POWER DRIVEN FASTENER
DBL	DOUBLE		
DEMO	DEMOLITION	PJ	PANEL JOINT
DET	DETAIL	PJP	PARTIAL JOINT PENETRATION
DIA, Ø	DIAMETER	PL	PLATE
DIAG	DIAGONAL	PLC(S)	PLACE(S)
DIM	DIMENSION	PLF	POUNDS PER LINEAR FOOT
DIR	DIRECTION	PLYWD	PLYWOOD
DO	DITTO	PREFAB	PREFABRICATED
DWG	DRAWING	PSF	POUNDS PER SQUARE FOOT
(E)	EXISTING	PSI	POUNDS PER SQUARE INCH
EA	EACH	PT	PRESSURE TREATED OR POST TENSION
EF	EACH FACE		
EJ	EXPANSION JOINT	QTY	QUANTITY
EMBED	EMBEDMENT	RAD, R	RADIUS
ELEC	ELECTRICAL	REF	REFERENCE
ELEV	ELEVATION OR ELEVATOR	REINF	REINFORCING
EN	EDGE NAILING	REQD	REQUIRED
E.O.	EDGE OF	(S)	"SIMPSON" STRONG TIE CO. OR "USP" W/ EQUIVALENT THIRD PARTY EVALUATION VALUES
EOD	EDGE OF DECK		
EQ	EQUAL		
EQUIP	EQUIPMENT	SB	SILL BOLT
ES	EACH SIDE OR EDGE SCREW	SC	SNUG CUT OR SLIP-CRITICAL
EW	EACH WAY	SCHED	SCHEDULE
EXP	EXPANSION	SEOR	STRUCTURAL ENGINEER OF RECORD
EXT	EXTERIOR		
FIN	FINISH	SHTG	SHEATHING
FLG	FLANGE	SIM	SIMILAR
FLR	FLOOR	SMS	SHEET METAL SCREW
FN	FIELD NAILING	SN	SILL NAIL
FND	FOUNDATION	SOG	SLAB ON GRADE
F.O.	FACE OF	SQ	SQUARE
FS	FAR SIDE OR FIELD SCREW	SS	STAINLESS STEEL
FRMG	FRAMING	STD	STANDARD
FRP	FIBER REINFORCED POLYMER	STGRD	STAGGERED
FT	FOOT OR FEET	STIFF	STIFFENER
FTG	FOOTING	STL	STEEL
F_y	YIELD STRESS	STRUCT	STRUCTURAL
GA	GAGE	T&B	TOP & BOTTOM
GALV	GALVANIZED	T&G	TONGUE AND GROOVE
GB	GRADE BEAM	THK	THICK
GC	GENERAL CONTRACTOR	THRD	THREADED
GLB	GLUED-LAMINATED BEAM	T.O.	TOP OF
HAB	HEADED ANCHOR BOLT	TRANS	TRANSVERSE
HD	HOLDOWN	TYP	TYPICAL
HDG	HOT-DIPPED GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HDR	HEADER	VERT	VERTICAL
HGR	HANGER	VIF	VERIFY IN FIELD
HK	HOOK	W/	WITH
HORIZ	HORIZONTAL	W/O	WITHOUT
HP	HIGH POINT	WF, W	WIDE FLANGE
HS	HIGH-STRENGTH	WHS	WELDED HEADED STUD
HSB	HIGH-STRENGTH BOLT	WLD	WELDED
HSS	HOLLOW STRUCTURAL SECTION	WO	WHERE OCCURS
HT	HEIGHT	WP	WORK POINT
ID	INSIDE DIAMETER	WT	WEIGHT
I.F.	INSIDE FACE	WWF	WELDED WIRE FABRIC
IN	INCH		

REFERENCE ELEVATION OR WORK POINT

LFRS (LFRS) — INDICATES THAT A DETAIL OR PORTION OF FRAMING IS A PART OF THE LATERAL FORCE RESISTING SYSTEM AND IS SUBJECT TO ADDITIONAL REQUIREMENTS OUTLINED IN THE GENERAL NOTES AND SPECIFICATIONS

TYPICAL HATCH PATTERNS USED (UNLESS NOTED OTHERWISE):

CONCRETE | STEEL | SOIL/EARTH

MASONRY | GROUT/SAND | PLYWOOD/SHEATHING

EXISTING ELEMENTS ARE SHOWN AS HALFTONE, NEW ELEMENTS ARE SHOWN AS FULL TONE UNO; EXAMPLE:

INDICATES A NEW ELEMENT

INDICATES AN EXISTING ELEMENT

SAWN LUMBER:

CONTINUOUS | BLOCKING | END OF MEMBER

SHOTCRETE

032713-0000

1. SHOTCRETING SHALL CONFORM TO ALL REQUIREMENTS OF ACI 506R AND 506.2, EXCEPT AS MODIFIED BY THE FOLLOWING REQUIREMENTS (ALL OTHER APPLICABLE REQUIREMENTS OF THE CODE, INCLUDING ALL REQUIREMENTS FOR PNEUMATICALLY PLACED WET-MIXED MORTAR, AND MAXIMUM TIME IN MIXER, SHALL APPLY):
   a. APPLICATORS OF STRUCTURAL WET MIX SHOTCRETE SHALL HAVE A COPY OF ACI 506R. ON EACH WORK SITE AT THE TIME OF SHOTCRETING.
   b. THE WORD "SHALL" SHALL BE SUBSTITUTED WHEREVER THE WORD "SHOULD" OCCURS IN ACI 506R.
   c. THE CONCRETE MIX SHALL COMPLY WITH THE CODE AND SHALL NOT BE BATCHED VOLUMETRICALLY.
   d. A TEST CONSISTING OF AT LEAST TWO CYLINDERS AT 28 DAYS IS REQUIRED.
2. SHOTCRETE MIX DESIGN AND TESTING SHALL COMPLY WITH ACI 506.2 AND STRUCTURAL CONCRETE NOTES.
3. STRUCTURAL WET MIX SHOTCRETE SHALL NOT BE PLACED WHERE THE STREAM FROM THE NOZZLE CANNOT DIRECTLY IMPINGE ON THE SURFACE ON WHICH THE CONCRETE IS TO BE PLACED. WHERE THE CONDITION PRECLUDES THE POSSIBILITY OF OBTAINING CORES FROM THE STRUCTURE, THIS METHOD SHALL NOT BE USED.
4. SHOTCRETE CONTRACTOR SHALL SHOW A MINIMUM OF 5 YEARS EXPERIENCE ON SIMILAR SEISMIC BUILDING PROJECTS AND SHALL BE APPROVED BY THE SEOR. ONLY A QUALIFIED PERSON ON THE NOZZLE WITH A MINIMUM OF THREE YEARS STRUCTURAL WET MIX SHOTCRETE EXPERIENCE AND POSSESSING WRITTEN DOCUMENTATION OF THAT EXPERIENCE SHALL APPLY WET MIX SHOTCRETE. THE WET MIX SHOTCRETE SUPERVISOR AND THE PERSON AT THE NOZZLE SHALL PROVIDE A RESUME APPROVED BY THE AUTHORITY HAVING JURISDICTION PRIOR TO PLACING. THE SUBCONTRACTOR WHO WILL PLACE THE SHOTCRETE SHALL SUPPLY A WRITTEN RESUME OF HIS/HER EXPERIENCE IN THE PLACING OF STRUCTURAL SHOTCRETE (OTHER THAN SWIMMING POOLS) AND LOCATIONS OF PREVIOUS JOBS APPROVED BY THE AUTHORITY HAVING JURISDICTION.
5. THE MINIMUM SPACING OF THE REINFORCING STEEL SHALL BE SIX BAR DIAMETERS FOR WALLS WITH ONE CURTAIN OF STEEL. WHERE TWO CURTAINS OF STEEL ARE PROVIDED, THE CURTAIN NEAREST THE NOZZLE SHALL HAVE A MINIMUM SPACING OF 12 BAR DIAMETERS AND THE REMAINING CURTAIN SHALL HAVE A MINIMUM SPACING OF SIX BAR DIAMETERS. REINFORCING STEEL SHALL HAVE A MINIMUM CLEAR DISTANCE BETWEEN REINFORCING BARS AT SPLICES. IN ALL CASES, THE MINIMUM CLEAR DISTANCE BETWEEN REINFORCING BARS (OTHER THAN MESH) SHALL BE 2 1/2". EXCEPTION: CONTACT SPLICES MAY BE USED FOR #5 BARS AND SMALLER.
6. CONTINUOUS INSPECTION BY A REGISTERED DEPUTY BUILDING INSPECTOR IS REQUIRED DURING PLACEMENT OF SHOTCRETE AND TAKING OF CORES.
7. PREPARE PRECONSTRUCTION TEST PANELS FOR EXAMINATION BY THE SPECIAL INSPECTOR PRIOR TO JOB SHOTCRETE PLACEMENT. PREPARATION AND TESTING SHALL COMPLY WITH ASTM C 1140. PRODUCE TEST PANELS (4'-0"x4'-0" MINIMUM) FOR EACH PROPOSED MIX DESIGN, SHOOTING ORIENTATION AND NOZZLEMAN. PRECONSTRUCTION TESTING SHALL BE IN ACCORDANCE WITH ACI 506.2 SECTION 1.6. EXAMINATION OF THE CORES SHALL BE IN ACCORDANCE WITH SECTION 1.7. ONLY NOZZLEMEN WITH A TEST PANEL MEAN CORE GRADE OF 2.5 OR LESS SHALL BE ALLOWED TO PLACE SHOTCRETE. IF A PANEL IS REJECTED, A 2ND PANEL MAY BE SHOT; THE MEAN CORE GRADE OF THE 2ND TEST PANEL SHALL BE 2.5 OR LESS.
8. PRODUCE A CONSTRUCTION TEST PANEL FOR EACH MIX AND EACH WORK DAY OR EVERY 50 CUBIC YARDS, WHICHEVER IS LESS. OBTAIN TEST SPECIMENS FROM EITHER A JOB SITE TEST PANEL PER ASTM C 1140 OR IN-PLACE SHOTCRETE PER ASTM C 42. GRADE CORES WITH REFERENCE PER ACI SECTION 1.7. TEST UNREINFORCED CORES PER ACI 506.2 SECTION 1.6 FOR CONFORMANCE TO CONCRETE COMPRESSIVE STRENGTH INDICATED. CORE LOCATIONS SHALL BE FREE OF VOIDS AND REBOUND. CORE LOCATIONS SHALL BE SELECTED BY THE SPECIAL INSPECTOR WITH APPROVAL BY THE SEOR.
9. WHEN SHOOTING UP TO THE UNDERSIDE OF EXISTING CONCRETE, THE LAST TWO INCHES SHALL BE DRYPACKED OR AN APPROVED METHOD OF DRY PNEUMATIC CONCRETE SHALL BE USED. EXCEPTION: PROVIDED THE DETAIL OF THE JOINT IS SLOPED SO THAT THE CLOSURE OF THE COLD JOINT MADE WITH STRUCTURAL WET MIX SHOTCRETE DOES NOT SAG AWAY FROM THE UPPER SURFACE AND PROVIDED BOTH SIDES OF THE COLD JOINT HAVE TAKEN THEIR INITIAL SET, THE JOINT CLOSURE MAY BE MADE WITH STRUCTURAL WET MIX SHOTCRETE.
10. REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE IN A MANNER THAT PREVENTS ANY MOVEMENT DURING THE WET MIX SHOTCRETING.
11. THE HEIGHT OF A LAYER SHALL BE LIMITED TO NOT MORE THAN THREE FEET AND A SUCCEEDING LAYER SHALL NOT BE PLACED IN MORE THAN 30 MINUTES. NO SLOUGHING OR SAGGING SHALL BE PERMITTED. EXCEPTION: A SEOR MAY AUTHORIZE A SUCCEEDING LAYER TO BE PLACED IN MORE THAN 30 MINUTES. FOR SUCCEEDING LAYERS EXCEEDING 30 MINUTES, TAPER JOINT TO A THIN EDGE. CLEAN AND WET JOINT PRIOR TO APPLYING SUCCEEDING LAYER. NO SLOUGHING OR SAGGING SHALL BE PERMITTED.
12. THE MINIMUM SLUMP SHALL BE 1 1/2" AND THE MAXIMUM SHALL BE 2 1/2". SLUMP SHALL BE MEASURED AT THE POINT OF DISCHARGE FROM THE MIXER.
13. A CAPABLE NOZZLEPERSON'S HELPER WITH AN AIR BLOW PIPE SHALL BE PROVIDED TO ASSIST THE NOZZLEPERSON IN KEEPING ALL REBOUND BUILD-UP OUT OF THE WORK. ADDITIONAL WORKERS MAY BE REQUIRED TO TAKE REBOUND FROM THE WORK IF THE REBOUND CANNOT BE REMOVED BY THE AIR BLOW PIPE.
14. SHOTCRETE PLACEMENT OVER EARTH:
   a. RIGID BACKING: PRIOR TO SHOTCRETE APPLICATION, PLACE RIGID OR OTHER APPROVED BACKING AGAINST EARTH WHERE THERE IS ANY LIKEHOOD OF SOIL BEING DISLODGED IN SUFFICIENT QUANTITY TO DAMAGE SHOTCRETE. ALSO, PLACE BACKING WHERE VOIDS IN EMBANKMENT ARE TO BE BRIDGED.
   b. SLOUGHING EARTH: IF PREVIOUSLY PRESUMED SOLID EMBANKMENT SHOULD SLOUGH IN SUFFICIENT QUANTITY TO DAMAGE SHOTCRETE, DISCONTINUE SHOTCRETE PLACEMENT WORK IN THAT AREA UNTIL A RIGID BACKING IS INSTALLED AND CONTAMINATED SHOTCRETE IS REMOVED.
15. REMOVE LOOSE MATERIAL FROM SURFACE TO RECEIVE SHOTCRETE AND THOROUGHLY CLEAN AND WASH DOWN WITH WATER AND COMPRESSED AIR SURFACES. CONCRETE SURFACES SHALL BE THOROUGHLY WETTED PRIOR TO APPLICATION OF SHOTCRETE.
16. NO KEYWAYS OR EMBEDMENTS SHALL BE PLACED IN FRONT FACE THAT WILL INTERFERE WITH THE STREAM FROM THE NOZZLE.
17. THE CONTRACTOR SHALL PROVIDE A DESIGNATED LIAISON BETWEEN HIS/HER CREW, THE DEPUTY INSPECTOR AND THE BUILDING INSPECTOR.
18. THE SPECIAL INSPECTOR SHALL BE INTERVIEWED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION PRIOR TO INSPECTING THE WORK AT THE JOBSITE, AND ONE DEPUTY SHALL BE ASSIGNED TO EACH NOZZLE.
19. REMOVE REBOUND AND DO NOT REUSE. CUT AWAY LAITANCE, SAGS, AND DEFECTS.

ENGINEERED WOOD PRODUCTS

061000-0002

1. THE FOLLOWING MATERIALS ARE BASED ON LUMBER MANUFACTURED BY WEYERHAEUSER. ALTERNATE PRODUCTS BY OTHER MANUFACTURERS MAY BE SUBSTITUTED PROVIDED THEY HAVE A CURRENT THIRD PARTY EVALUATION REPORT FOR EQUIVALENT OR GREATER LOAD AND STIFFNESS PROPERTIES AND ARE REVIEWED AND APPROVED BY THE SEOR.
   a. LAMINATED VENEER LUMBER (LVL): CONFORM TO ICC ESR-1387
   b. PARALLEL STRAND LUMBER (PSL): CONFORM TO ICC ESR-1387
   c. LAMINATED STRAND LUMBER (LSL): CONFORM TO ICC ESR-1387

ENGINEERED WOOD REQUIREMENTS:

TYPE	USE	WIDTHS	E(10ᵏ) (PSI)	F_b (PSI)	F_v (PSI)	$F_{c⊥}$ (PSI)
LSL RIMBOARD	RIMBOARD	1 1/4", 1 1/2"	1.3E	1,700	400	1,400
	STAIR STRINGER	1 1/2"				
TIMBERSTRAND LSL	HEADER, BEAM, OR COLUMN < 9" DEPTH	3 1/2"	1.3E	1,700	400	1,400
TIMBERSTRAND LSL	RIMBOARD, HEADER, OR BEAM > 9" DEPTH	1 3/4", 3 1/2"	1.55E	2,325	310	2,050
TIMBERSTRAND LSL	WALL STUD 2x4 & 2x6	1 1/2"	1.3E	1,700	400	1,400
	WALL STUD > 2x6	1 1/2"	1.5E	2,250	400	1,950
MICROLLAM LVL	HEADER, BEAM	1 3/4"	2.0E	2,600	285	2,510
PARALLAM PSL	HEADER, BEAM	3 1/2", 5 1/4", 7"	2.2E	2,900	290	2,900
PARALLAM PSL	COLUMN	3 1/2", 5 1/4", 7"	1.8E	2,400	190	2,500

ROUGH CARPENTRY / WOOD

061000-0000

1. ALL GRADES SPECIFIED ARE MINIMUM GRADES REQUIRED. DOUGLAS FIR-LARCH SHALL BE GRADED BY A GRADING AGENCY CERTIFIED BY THE ALSC TO THE WCLIB OR WWPA GRADING RULES, CONFORMING TO DOC PS 20. REDWOOD SHALL BE GRADED BY THE CALIFORNIA REDWOOD ASSOCIATION, REDWOOD INSPECTION SERVICE.
2. WOOD SPECIES SPECIFICATIONS ("DF" INDICATES DOUGLAS FIR-LARCH CONFORMING TO DOC PS20):

NON-LOAD-BEARING STUDS, TOP PLATES, BLOCKING, FURRING AND BRACING	DF #2
JOISTS, RAFTERS, PURLINS, BEAMS & POSTS	DF #1 (UNO)
LOAD-BEARING STUDS (UNO)	
HEIGHT NOT EXCEEDING 15'-0"	DF #2
HEIGHT EXCEEDING 15'-0"	DF #1

3. MOISTURE CONTENT OF SAWN LUMBER SHALL NOT EXCEED 19% WHEN FRAMING STARTS OR SHEATHING IS APPLIED. ANY NONCOMPLIANT WORK SHALL BE REJECTED AND REFRAMED WITH ACCEPTABLE LUMBER.
4. ARCHITECTURALLY EXPOSED TIMBERS 4" NOMINAL IN THE LEAST DIMENSION SHALL NOT CONTAIN BOXED HEART.
5. PROVIDE FIRE-RETARDANT-TREATED (FRT) LUMBER AND WOOD STRUCTURAL PANELS PER CBC SECTION 2303.2 WHERE INDICATED BY ARCHITECT.
6. WOOD MEMBERS SHALL BE PRESERVATIVE-TREATED (PT) OR NATURALLY DURABLE (WITH APPROVAL OF SEOR) WHERE EXPOSED TO WEATHER AND IN ACCORDANCE WITH CBC SECTION 2304.12. SILL PLATES SHALL BE PRESERVATIVE-TREATED DOUGLAS FIR #2. END CUTS AND HOLES IN PT SILL PLATES SHALL BE TREATED.
7. FASTENERS, INCLUDING NUTS AND WASHERS, FOR PRESERVATIVE-TREATED WOOD, WOOD EXPOSED TO WEATHER, AND FIRE- RETARDANT-TREATED WOOD SHALL BE OF HOT-DIPPED ZINC-COATED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE OR COPPER. THE COATING WEIGHTS FOR ZINC-COATED FASTENERS SHALL BE IN ACCORDANCE WITH ASTM A153, EXCEPTIONS: FASTENERS OTHER THAN NAILS, TIMBER RIVETS, WOOD SCREWS AND LAG SCREWS SHALL BE PERMITTED TO BE OF MECHANICALLY DEPOSITED ZINC-COATED STEEL WITH COATING WEIGHTS IN ACCORDANCE WITH ASTM B695, CLASS 55 MINIMUM, AND PLAIN CARBON STEEL FASTENERS, INCLUDING NUTS AND WASHERS, IN SBX/DOT AND ZINC-BORATE PRESERVATIVE-TREATED WOOD IN AN INTERIOR, DRY ENVIRONMENT SHALL BE PERMITTED.
8. UNLESS NOTED OTHERWISE, SILL FASTENERS FOR INTERIOR NON-STRUCTURAL WALLS MAY BE 0.157" DIAMETER x 1 1/4" EMBED PDF's AT 16"OC.
9. SILL PLATES SHALL BE BOLTED TO CONCRETE WITH 5/8" DIAMETER ANCHOR BOLTS AT 48" OC MAX, UNO, WITH A BOLT BETWEEN 7 x BOLT DIAMETER (4 3/8" MIN) AND 12" FROM THE END OF EACH PIECE OF SILL (2 BOLTS MIN EACH PIECE). PIECE OF SILL SHALL BE CONSIDERED ENDED WHERE PLATE IS CUT OVER ONE-THIRD OF CROSS-SECTION.
10. ANCHOR BOLTS FOR BEARING WALLS SHALL HAVE 7" EMBEDMENT (UNO) MEASURED FROM TOP OF SLAB.
11. ALL BOLTS IN WOOD SHALL BE ASTM A307 STANDARD BOLTS, UNO. BOLTS AND SCREWS SHALL BE TIGHTENED AT TIME OF ERECTION AND RETIGHTENED BEFORE CLOSING IN OR AT THE COMPLETION OF THE JOB. HOLES IN WOOD AND STEEL MEMBERS FOR BOLTS SHALL BE THE NOMINAL BOLT DIAMETER PLUS 1/16".
12. ALL NAIL SPACING, EDGE DISTANCES, AND END DISTANCES SHALL BE SUCH AS TO AVOID SPLITTING OF THE WOOD. HOLES FOR NAILS, WHERE NECESSARY TO PREVENT SPLITTING, SHALL BE BORED OF A DIAMETER SMALLER THAN THAT OF THE NAILS.
13. HOLES IN WOOD FOR LAG SCREWS SHALL BE FIRST BORED TO THE SAME DIAMETER AND DEPTH AS THE SHANK. HOLES FOR THE THREADED PORTION SHALL BE BORED WITH A BIT DIAMETER EQUAL TO 40% TO 70% OF THE SHANK DIAMETER IN DOUGLAS FIR. FOR OTHER WOOD SPECIES, REFER TO THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS).
14. LAG SCREWS AND SCREWS SHALL BE SCREWED AND NOT DRIVEN INTO PLACE.
15. STANDARD CUT STEEL WASHERS SHALL BE PROVIDED UNDER HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS WHICH BEAR ON WOOD. SEE SHEAR WALL SCHEDULE FOR WASHER REQUIREMENTS AT SHEAR WALL SILL BOLTS WHERE OCCUR.
16. STUD BEARING WALLS AND PARTITIONS SHALL HAVE DOUBLE TOP PLATES LAPPED AT INTERSECTIONS. JOINTS IN UPPER AND LOWER MEMBERS OF DOUBLE TOP PLATES SHALL BE STAGGERED AT LEAST 4'-0".
17. NOTCHING AND HOLES SHALL NOT BE ALLOWED EXCEPT AS DETAILED ON THESE PLANS OR AS APPROVED BY THE SEOR.
18. INSTALL WINDOWS AND DOORS IN STUD WALLS AFTER DEAD LOADS ARE APPLIED, AND PROVIDE A 1/2" SHIM SPACE AT THE HEAD CONDITION.
19. STRUCTURAL FLOOR, ROOF AND WALL SHEATHING SHALL BE APA-RATED AND SHALL CONFORM TO DOC PS1 OR PS2.
20. EXTERIOR STUD WALLS SHALL BE COMPLETELY SHEATHED WITH 15/32" SHEATHING, EXPOSURE-1 (32/16), TYPICAL, UNO.
21. INTERIOR BEARING WALLS SHALL BE SHEATHED WITH 1/2" GYP BOARD EACH SIDE, FULL HEIGHT, UNO.
22. ALL STRUCTURAL WALL SHEATHING SHALL BE SPLICED ON 2" NOMINAL BLOCKING AT HORIZONTAL JOINTS, UNO.
23. AT FLOOR FRAMING, PROVIDE BRIDGING OR FULL-HEIGHT BLOCKING AS REQUIRED BY THE BUILDING CODE.
24. STRUCTURAL FLOOR AND ROOF SHEATHING SHALL BE APA-RATED EXPOSURE-1. 1/8" GAP SHALL BE PROVIDED BETWEEN ADJACENT SHEATHING PANELS. PANELS WITH GRADE STAMP INDICATION "SIZED FOR SPACING" MAY BE USED TO FACILITATE THIS REQUIREMENT. SHEATHING AT EXTERIOR DECKS SHALL BE EXTERIOR RATED PLYWOOD.
25. AT FLOOR APPLICATIONS, ATTACH FLOOR SHEATHING TO FRAMING USING RING-SHANK NAILS AND GLUE.
26. WOOD STRUCTURAL PANEL ROOF SHEATHING SHALL BE OF TYPE MANUFACTURED WITH EXTERIOR GLUE (EXTERIOR I OR EXTERIOR)

NAILING SCHEDULE

061000-0001

(UNLESS OTHERWISE NOTED ON PLANS)

COMMON NAILS SHALL BE USED FOR NAILING AT TYPICAL CONNECTIONS NOTED BELOW (UNO).

CONNECTION, NAIL TYPE	NAILING
JOISTS TO SILL OR GIRDER, TOENAIL	(3) 8d
JOISTS TO RIM JOIST, FACE NAIL	(3) 16d
BRIDGING TO JOIST, TOENAIL EACH END	(2) 8d
BLOCKING BETWEEN JOISTS/RAFTERS TO TOP PLATE, TOENAIL	(3) 8d
1" x 6" NARROWER SUBFLOOR TO EACH JOIST, FACE NAIL	(2) 8d
WIDER THAN 1" x 6" SUBFLOOR TO EACH JOIST, BLIND AND FACE NAIL	(3) 8d
2" SUBFLOOR TO JOIST OR GIRDER, BLIND AND FACE NAIL	(2) 16d
SILL PLATE TO JOIST OR BLOCKING, FACE NAIL	16d @ 16"OC
TOP PLATE TO STUD, END NAIL	(2) 16d, TYP, UNO (4) 16d @ 2x10 STUDS
STUD TO SILL PLATE	(4) 8d TOENAIL OR (2) 16d END NAIL, TYP, UNO (7) 8d TOENAIL OR (4) 16d END NAIL @ 2x10 STUDS (2) 20 END NAIL @ 3x SILL PLATE
DOUBLE STUDS, FACE NAIL	16d @ 24"OC
DOUBLE TOP PLATES, FACE NAIL	16d @ 16"OC
TOP PLATES, LAPS, FACE NAIL	(8) 16d, UNO (18) 16d @ SHEARWALL LOCATIONS, UNO
TOP PLATES AT INTERSECTIONS, FACE NAIL	(2) 16d
CONTINUOUS HEADER, TWO PIECES	16d @ 16"OC ALONG EA EDGE
CEILING JOISTS TO PLATE, TOENAIL	(3) 8d
CONTINUOUS HEADER TO STUD, TOENAIL	(4) 8d
CEILING JOISTS, LAPS OVER PARTITIONS, FACE NAIL	(3) 16d
CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL	(3) 16d
RAFTER TO PLATE, TOENAIL	(3) 8d
RIM JOIST TO TOP PLATE, TOENAIL	8d @ 6"OC
JACK RAFTER TO HIP, FACE NAIL	(2) 16d
1" BRACE TO EACH STUD & PLATE, FACE NAIL	(2) 8d
ROOF RAFTER TO 2x RIDGE BEAM, FACE NAIL	(2) 16d
1"x8" SHEATHING OR LESS TO EACH BEARING, FACE NAIL	(3) 8d
WIDER THAN 1"x8" SHEATHING TO EACH BEARING, FACE NAIL	(3) 8d
2" PLANKS	16d @ EA BEARING
BUILT-UP CORNER STUDS	16d @ 24"OC
BUILT-UP GIRDERS AND BEAMS	20d @ 32"OC @ TOP & BOTT & STGRD (2) 20d @ ENDS & @ EA SPLICE (2) 16 @ EA BEARING

NAIL SCHEDULE (COMMON NAILS)		
SIZE	DIAMETER (IN)	LENGTH (IN)
8d	0.131	2 1/2
10d	0.148	3
12d	0.148	3 1/4
16d	0.162	3 1/2
20d	0.192	4

METAL DECK

053000-0000

1. SEE TYPICAL DETAILS FOR REINFORCING OF DECK AROUND OPENINGS. CONTRACTOR SHALL COORDINATE SIZE AND LOCATIONS OF OPENINGS WITH THE VARIOUS TRADES. NO LOADS SHALL BE HUNG FROM DECK WITHOUT APPROVAL OF SEOR.
2. FLOOR AND ROOF DECK IS DESIGNED FOR UNSHORED CONSTRUCTION, UNO. MAINTAIN 3 SPAN CONDITION WHEREVER POSSIBLE (2 SPAN MIN) EXCEPT AT STAIR LANDING AND WHERE NOTED OTHERWISE ON PLANS.
3. PROVIDE 2" MINIMUM BEARING AT ALL SUPPORTS. END LAPS OF METAL DECK SHALL BE A MINIMUM OF 2" AND SHALL OCCUR ONLY OVER SUPPORTS. DECK SHALL BE LAID OUT SO THAT A LOW FLUTE FALLS ON EACH PARALLEL SUPPORT.
4. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS SHALL SHOW TYPE OF DECK, LAYOUT OF DECK, THE SIZE AND LOCATION OF ANY OPENINGS OF WIDTH GREATER THAN 1'-0", AND ATTACHMENT METHOD.
5. ALTERNATES TO TYPE OF DECK AND FASTENING MAY BE USED WITH THE APPROVAL OF THE SEOR. DECK PROPERTIES SHALL BE EQUAL TO OR GREATER THAN THOSE SHOWN ON THE PLANS. ANY DECK OR METHOD OF FASTENING SHALL HAVE AN EVALUATION REPORT APPROVING THE DECK FOR THE APPLICATION.
6. METAL DECK WITH CONCRETE FILL SHALL HAVE POSITIVE VENTING. DO NOT EMBED PIPES, SLEEVES, CONDUIT, ETC IN CONCRETE TOPPING, UNO.
7. WELDING OF METAL DECK SHALL BE IN ACCORDANCE WITH AMERICAN WELDING SOCIETY (AWS) D1.3.
8. PLACE CONCRETE FIRST OVER BEAMS AND GIRDERS RATHER THAN AT MIDSPAN OF DECK. DO NOT PILE CONCRETE HIGHER THAN THE FINISHED DEPTH OF THE SLAB.

COLD-FORMED STEEL FRAMING

054000-0000

1. DESIGN, FABRICATION AND ERECTION OF COLD-FORMED STEEL FRAMING SHALL CONFORM TO THE SPECIFICATIONS AND STANDARD OF THE AMERICAN IRON AND STEEL INSTITUTE (AISI), AS CONTAINED IN THE "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", INCLUDING ALL APPLICABLE AMENDMENTS.
2. ALL COLD-FORMED STEEL FRAMING SHALL BE ERECTED PLUMB AND TRUE TO LINE. TEMPORARY BRACING SHALL BE INSTALLED AND LEFT IN PLACE UNTIL OTHER MEANS IS PROVIDED TO ADEQUATELY BRACE THE STRUCTURE. ALL COLD-FORMED STEEL FRAMING SHALL BE BRACED AS REQUIRED BY SECTION D3 OF THE AISI SPECIFICATION.
3. COLD-FORMED STEEL GRADES:

18GA (43 MILS) OR THINNER	ASTM A1003 GRADE 33 (FY = 33 KSI)
16GA (54 MILS) AND THICKER	ASTM A1003 GRADE 50 (FY = 50 KSI)

4. THE THICKNESS OF TRACKS SHALL NOT BE LESS THAN THE THICKNESS OF THE MEMBER CONNECTING TO IT.
5. STUD ENDS SHALL ACHIEVE FULL BEARING AGAINST TRACK WEB, UNLESS NOTED OTHERWISE.
6. COLD-FORMED STEEL MEMBERS ARE TO BE ATTACHED WITH SHEET METAL SCREWS (SMS). PENETRATION OF SCREWS THROUGH JOINED MATERIAL SHALL NOT BE LESS THAN 3 EXPOSED THREADS. SCREWS ARE TO BE INSTALLED AND TIGHTENED IN ACCORDANCE WITH SCREW MANUFACTURER'S RECOMMENDATIONS. SHEET METAL SCREWS SHALL COMPLY WITH ASTM C1513, SELF-DRILLING AND TAPPING TYPE, WITH PANCAKE FRAMER HEAD TYPE FOR #10 SMS AND HEX WASHER HEAD TYPE FOR #12 AND #14 (1/4"Ø) SMS UNLESS NOTED OTHERWISE.
7. COLD-FORMED MEMBERS SHALL BE UNPUNCHED WHERE USED FOR THE FOLLOWING: HEADERS AND SILLS OF OPENINGS WIDER THAN 3'-0", AND BUILT-UP SECTIONS. PUNCH-OUTS SHALL BE LOCATED IN THE CENTER OF THE WEB WITH A MINIMUM SPACING OF 24"OC, HAVE A MAXIMUM WIDTH OF HALF THE MEMBER DEPTH OR 2 1/2", WHICHEVER IS LESS, AND A MAXIMUM LENGTH OF 4 1/2". THE MINIMUM DISTANCE BETWEEN THE END OF THE MEMBER OR A SUPPORT AND THE NEAR EDGE OF THE PUNCH-OUT SHALL BE 10".
8. WELDING OF LIGHT GAGE STEEL SHALL BE IN ACCORDANCE WITH AMERICAN WELDING SOCIETY (AWS) D1.3.
9. COLD-FORMED MEMBER DESIGNATIONS ARE AS FOLLOWS:

600 S 250 - 54

- MATERIAL THICKNESS (E.G. 54 MILS = 0.054 IN)
- FLANGE WIDTH (E.G. 250 x 1/100 = 2.5 IN)
- SECTION TYPE (S = STUD, T = TRACK, U = CHANNEL, F = FURRING CHANNEL)
- MEMBER DEPTH (E.G. 600 x 1/100 = 6.00 IN)

STUD TYPE	DESIGNATION THICKNESS (MILS)	GAGE (FOR REFERENCE ONLY)
NON-STRUCTURAL	18	25
	27	22

EXTERIOR BUILDING FACADE

1. THE ITEM(S) INCLUDED IN THIS SECTION ARE DESIGN-BUILD AND/OR BIDDER-DESIGNED.
2. EXTERIOR BUILDING FACADE INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING SYSTEMS:
   a. WINDOW WALLS
   b. CURTAIN WALLS
3. CONTRACT DOCUMENTS INDICATE INFORMATION SUFFICIENT TO CONVEY DESIGN INTENT. AT SOME LOCATIONS THERE MAY BE INDICATIONS OF SUPPORTS AND FASTENINGS. AT OTHER LOCATIONS THERE MAY NOT BE SUCH INDICATIONS. IN BOTH INSTANCES IT IS NOT INTENDED BY ARCHITECT (SEOR) TO SUPPLY CONTRACTOR WITH STRUCTURAL DESIGN CRITERIA, BUT RATHER TO SHOW WHERE SUPPORTS AND FASTENINGS APPEAR IN A GENERAL LOCATION ONLY. IF AREAS ARE SO LOCATED ARE INADEQUATE, AND IF ADDITIONAL SUPPORTS, FASTENINGS, BRACES, AND OTHER STRUCTURAL ELEMENTS AND FEATURES ARE REQUIRED FOR THE WORK, PROVIDE THEM AT NO ADDITIONAL COST TO OWNER AND ADVISE ARCHITECT OR SEOR OF THE NEED THEREOF.
4. AT CONNECTIONS TO STRUCTURE, PROVIDE STABILIZING ELEMENTS SUCH AS BRACES, STIFFENER PLATES, ETC, SO AS NOT TO IMPOSE ECCENTRIC LOADING, TWISTING, OR WARPING TO STRUCTURAL MEMBERS. PROVIDE MATERIAL AND INSTALL STABILIZING ELEMENTS AT NO ADDITIONAL COST TO OWNER.
5. DESIGN MEMBERS AND CONNECTIONS (INCLUDING THOSE TO STRUCTURAL FRAMING) AND PROVIDE FOR LATERAL RESTRAINT COMPLYING WITH BUILDING CODE AND CONTRACT DOCUMENTS.
6. PROVIDE ADEQUATE EXPANSION, CONTRACTION AND SEISMIC SEPARATION BETWEEN SUPPORTING STRUCTURE AND FACADE ELEMENTS.
7. SUBMIT DRAWINGS AND STRUCTURAL CALCULATIONS SIGNED BY AND BEARING THE SEAL OF A LICENSED ENGINEER FOR REVIEW BY THE SEOR AND APPROVAL BY THE AUTHORITY HAVING JURISDICTION.
8. UNLESS NOTED OTHERWISE, SLAB EDGES ARE NOT DESIGNED TO STRUCTURALLY SUPPORT FACADE ELEMENT CONNECTIONS. ANY CONNECTION TO SLAB EDGE SHALL BE ENGINEERED AND DETAILED BY FACADE CONTRACTOR.
9. UNLESS NOTED OTHERWISE, FACADE ELEMENTS SHALL ACCOMMODATE THE FOLLOWING VERTICAL DISPLACEMENT:
   a. FLOORS: GREATER OF L/360 AND 1"
   b. ROOF: GREATER OF L/240 AND 1"
10. UNLESS NOTED OTHERWISE, METAL STUD CONNECTIONS SHALL BE DESIGNED AS FOLLOWS:
    a. LATERAL LOADS (WIND AND SEISMIC) SHALL BE SUPPORTED AT EACH FLOOR / ROOF LEVEL.
    b. VERTICAL LOADS (GRAVITY) SHALL BE SUPPORTED AT EVERY OTHER FLOOR, AS A MINIMUM.
11. UNLESS NOTED OTHERWISE, THE FACADE SYSTEM SHALL BE DESIGNED TO ACCOMMODATE THE MAXIMUM STORY DRIFT AT EACH LEVEL, AS SPECIFIED IN THE STRUCTURAL DESIGN CRITERIA.

STRUCTURAL STEEL

1. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), AS CONTAINED IN THE "AISC MANUAL OF STEEL CONSTRUCTION". ALL WORK SHALL BE IN CONFORMANCE WITH THE TESTING, INSPECTION, QUALIFICATION, AND QUALITY ASSURANCE PROVISIONS AS REQUIRED BY THE BUILDING CODE AND ANY APPLICABLE STANDARDS. THESE STANDARDS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING: AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", AISC 303 "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", AISC 341 "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS", AWS D1.1 "STRUCTURAL WELDING CODE - STEEL", AWS D1.8 "STRUCTURAL WELDING CODE - SEISMIC SUPPLEMENT", AND RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS". CONFORMANCE TO SUPPLEMENTS TO THESE STANDARDS, IF PUBLISHED ON OR BEFORE THE DATE OF PERMIT ISSUANCE, IS ALSO REQUIRED. ALTHOUGH THESE CONTRACT DOCUMENTS INCLUDE GENERAL REFERENCES TO CODES AND STANDARDS, AND REFERENCES TO OR INCLUSIONS OF SPECIFIED PROVISIONS, OMISSIONS OF ANY APPLICABLE CODE, STANDARD, OR PROVISION DOES NOT RELIEVE THE GENERAL CONTRACTOR FROM COMPLIANCE TO THE APPLICABLE REQUIREMENTS. COORDINATION OF QUALITY CONTROL AND QUALITY ASSURANCE IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
2. STRUCTURAL STEEL MATERIALS/GRADES, UNO:

SHAPE	MATERIAL / GRADE
WIDE FLANGE & TEES	ASTM A992
PLATES, ANGLES, CHANNELS, THREADED RODS (UNO)	ASTM A36
HIGH-STRENGTH PLATE (UNO)	ASTM A572, GRADE 50
HIGH-STRENGTH PLATE 4 1/4" AND THICKER	ASTM A572, GRADE 42
SQUARE OR RECTANGULAR HOLLOW STRUCTURAL SECTIONS (HSS)	ASTM A500, GRADE C (Fy = 50 KSI) OR ASTM A1085
ROUND HOLLOW STRUCTURAL SECTIONS (HSS)	ASTM A500, GRADE C (Fy = 46 KSI) OR ASTM A1085
PIPES	ASTM A53 TYPE E OR S, GRADE B (Fy = 35 KSI)
MACHINE BOLTS (MB)	ASTM A307
WELDED HEADED STUDS	ASTM A29
THREADED RODS FOR ANCHOR BOLTS	ASTM F1554, GRADE 55

   a. EXCEPT AS OTHERWISE NOTED, ALL BOLTS SHALL BE HIGH-STRENGTH BOLTS.
3. ALL CONNECTIONS NOT SHOWN SHALL CONFORM TO THE "AISC MANUAL OF STEEL CONSTRUCTION" AND SHALL BE SUBMITTED ON SHOP DRAWINGS FOR REVIEW BY SEOR PRIOR TO FABRICATION.
4. ALL WELDED HEADED STUDS, THREADED STUDS, AND DEFORMED BARS SHALL BE NELSON, OR EQUIVALENT, AND WELDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS BY CERTIFIED WELDERS SO AS TO FULLY DEVELOP THE TENSILE CAPACITY OF THE CONNECTOR.
5. BOLTS WITH UPSET THREADS ARE NOT ALLOWED. USE THE APPROPRIATE NUT AND WASHER TYPE FOR THE SPECIFIED BOLT.
6. ALL STEEL FABRICATION SHALL BE PERFORMED BY A LICENSED FABRICATOR.
7. BEAMS NOT SPECIFIED WITH CAMBER SHALL HAVE MILL CAMBER PLACED IN UPWARD POSITION.
8. ALL STRUCTURAL STEEL AND MISCELLANEOUS STEEL PERMANENTLY EXPOSED TO THE ELEMENTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION UNLESS A WEATHERPROOF COATING IS APPROVED BY THE ARCHITECT. UNO, STAINLESS AND WEATHERING STEELS, WHERE SPECIFIED, ARE EXEMPT FROM THIS REQUIREMENT. GALVANIZED SURFACES SHALL BE PROTECTED DURING CONSTRUCTION AND SHALL BE REPAIRED AS NECESSARY. ALL ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS) SHALL COMPLY WITH AISC CODE OF STANDARD PRACTICE, SECTION 10.
9. SEE ARCHITECTURAL DRAWINGS FOR NAILER HOLES, WELDED STUDS OR OTHER ITEMS NOT SHOWN IN THESE DRAWINGS.
10. WHERE STEEL IS EMBEDDED IN CONCRETE OR MASONRY, PROVIDE HOLES AS REQUIRED FOR PASSAGE OF CONTINUOUS REINFORCING BARS WHERE INDICATED ON DRAWINGS.
11. DO NOT CUT HOLES IN STRUCTURAL STEEL WITHOUT APPROVAL OF THE SEOR.
12. PLACE NON-SHRINK OR DRYPACK GROUT UNDER ALL BASEPLATES AND ALLOW TO CURE UNTIL SPECIFIED STRENGTH IS REACHED BEFORE APPLYING LOADS.
13. WHERE AN HSS OR PIPE SECTION IS INSTALLED IN AN EXTERIOR CONDITION, PROVIDE CAP PLATE EACH END WITH SEAL WELD ALL AROUND.
14. PROVIDE 3" MIN CONCRETE COVER AT ALL SUBGRADE STEEL ELEMENTS.
15. THE USE OF ROLLED STEEL SECTIONS AND/OR BOLTS MANUFACTURED OUTSIDE THE UNITED STATES WILL REQUIRE VERIFICATION THAT THE PRODUCTS COMPLY WITH APPLICABLE ASTM STANDARDS. MILL CERTIFICATES WILL BE REQUIRED FOR ALL STEEL. STEEL GRADES OTHER THAN ASTM A36 WILL REQUIRE TESTING BY AN APPROVED LABORATORY. ALL FOREIGN BOLTS MUST BE APPROVED BY COUNTY OF LOS ANGELES BUILDING AND SAFETY PRIOR TO THEIR USE.

FIRE SPRINKLER ANCHORAGE

1. THE ITEM(S) INCLUDED IN THIS SECTION ARE DESIGN-BUILD AND/OR BIDDER-DESIGNED.
2. FIRE SPRINKLER CONTRACTOR SHALL PROVIDE CALCULATIONS, DETAILS AND PLANS OF ALL FIRE SPRINKLER ANCHORAGE. VERTICAL LOADS ARE PER BUILDING CODE AND LATERAL LOADS ARE PER NFPA 13.
3. FIRE SPRINKLER CONTRACTOR SHALL COORDINATE HANGER AND BRACING ANCHORAGE LOCATIONS WITH THE STRUCTURAL DRAWINGS AND ROOF AND FLOOR FRAMING SYSTEMS BY OTHERS.
4. SUBMIT DRAWINGS AND STRUCTURAL CALCULATIONS SIGNED BY AND BEARING THE SEAL OF A LICENSED ENGINEER FOR REVIEW BY THE SEOR AND APPROVAL BY THE AUTHORITY HAVING JURISDICTION.

METAL STAIRS

1. THE ITEM(S) INCLUDED IN THIS SECTION ARE DESIGN-BUILD AND/OR BIDDER-DESIGNED.
2. SUBMIT DRAWINGS AND STRUCTURAL CALCULATIONS SIGNED BY AND BEARING THE SEAL OF A LICENSED ENGINEER FOR REVIEW BY THE SEOR AND APPROVAL BY THE AUTHORITY HAVING JURISDICTION.
3. USE DEAD LOAD, 100 PSF LIVE LOAD AND SEISMIC LOAD PER CODE.
4. SEE ARCH FOR ALL DETAILS AND DIMENSIONS.
5. PROVIDE SLIP JOINTS AT EACH FLOOR TO ACCOMMODATE THE INTERSTORY DRIFT LIMITS DESCRIBED IN THE STRUCTURAL DESIGN CRITERIA.
6. STAIR MANUFACTURER/INSTALLER SHALL DESIGN ALL SUPPLEMENTAL FRAMING, COLUMNS, AND FOUNDATIONS.
7. STAIR MANUFACTURER TO PROVIDE CONNECTIONS AT EACH LEVEL. IF ECCENTRIC LOAD IS APPLIED AT BEAMS, PROVIDE BRACES AS REQUIRED TO ELIMINATE TORSION.

NONSTRUCTURAL EQUIPMENT ANCHORAGE

1. THE ITEM(S) INCLUDED IN THIS SECTION ARE DESIGN-BUILD AND/OR BIDDER-DESIGNED.
2. ALL MECHANICAL AND ELECTRICAL EQUIPMENT AND ARCHITECTURAL COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE HORIZONTAL AND VERTICAL FORCES PRESCRIBED IN THE CBC AND ASCE 7-16 CHAPTER 13.
3. SUBMIT DRAWINGS AND STRUCTURAL CALCULATIONS SIGNED BY AND BEARING THE SEAL OF A LICENSED ENGINEER FOR REVIEW BY THE SEOR AND APPROVAL BY THE AUTHORITY HAVING JURISDICTION.
4. ANCHORAGE OF ALL EQUIPMENT TO BE INSTALLED AS A PART OF THIS PROJECT SHALL BE DETAILED EXCEPT FOR THE FOLLOWING:
   a. EQUIPMENT WEIGHING LESS THAN 400 POUNDS SUPPORTED DIRECTLY ON THE FLOOR OR ROOF AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL
   b. FURNITURE (NON-FIXED AND MOVABLE)
   c. TEMPORARY OR MOVABLE EQUIPMENT
   d. ITEMS EXEMPTED BY CBC SECTIONS 1617.11.15 AND 1616A.1.18
   e. EQUIPMENT WEIGHING LESS THAN 20 POUNDS SUPPORTED BY VIBRATION ISOLATORS
   f. EQUIPMENT WEIGHING LESS THAN 20 POUNDS SUSPENDED FROM A ROOF OR FLOOR OR MOUNTED TO A WALL

ELEVATORS

1. THE ITEM(S) INCLUDED IN THIS SECTION ARE DESIGN-BUILD AND/OR BIDDER-DESIGNED.
2. GENERAL CONTRACTOR TO COORDINATE WITH ELEVATOR MANUFACTURER TO PROVIDE RAILS TO SPAN BETWEEN EACH LEVEL.
3. ELEVATOR MANUFACTURER TO PROVIDE CONNECTIONS AT EACH LEVEL. IF ECCENTRIC LOAD IS APPLIED AT BEAMS, PROVIDE BRACES AS REQUIRED TO ELIMINATE TORSION.
4. SUBMIT DRAWINGS AND STRUCTURAL CALCULATIONS SIGNED BY AND BEARING THE SEAL OF A LICENSED ENGINEER FOR REVIEW BY THE SEOR AND APPROVAL BY THE AUTHORITY HAVING JURISDICTION.

STRUCTURAL CONCRETE

1. CONCRETE SHALL BE MIXED, PLACED AND CURED IN ACCORDANCE WITH ACI 318 AND ACI 301 AND PROJECT SPECIFICATIONS.
2. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL (AS IN WALLS) SO AS TO CAUSE SEGREGATION OF AGGREGATES. IN SUCH CASES, HOPPERS AND VERTICAL CHUTES OR TRUNKS SHALL BE USED. CHUTES OR TRUNKS SHALL BE OF VARIABLE LENGTHS SO THAT FREE UNCONFINED FALL OF CONCRETE DOES NOT EXCEED SIX FEET. A SUFFICIENT NUMBER OF CHUTES OR TRUNKS SHALL BE USED TO ENSURE THE CONCRETE IS KEPT LEVEL AT ALL TIMES.
3. CONSTRUCTION JOINTS SHALL BE CLEANED AND ROUGHENED BY REMOVING THE ENTIRE SURFACE TO EXPOSE CLEAN AGGREGATE SOLIDLY EMBEDDED IN THE MORTAR MATRIX. LOCATIONS OF CONSTRUCTION JOINTS NOT SHOWN ON THESE PLANS SHALL BE SUBMITTED FOR APPROVAL TO THE SEOR PRIOR TO PLACING ANY CONCRETE.
4. STRUCTURAL CONCRETE SHALL MEET THE FOLLOWING DESIGN CRITERIA:

LOCATION	MIN 28-DAY COMP STRENGTH	CONC TYPE	MAX AGGREGATE SIZE	MAX W/C RATIO
NEW FOUNDATION	3000 PSI	NWC	1 1/2"	0.55
EXISTING FOUNDATION	2500 PSI			

   a. MAXIMUM AIR DRY UNIT WEIGHT OF LIGHTWEIGHT CONCRETE SHALL NOT EXCEED 115 PCF, UNLESS APPROVED BY SEOR.
   b. WHEN THE USE OF PLASTICIZER (ASTM C1017, TYPE I OR II) OR WATER REDUCER (ASTM C494, TYPE F OR G) IS USED, MAXIMUM SLUMP SHALL BE 4" PRIOR TO ADMIXTURE AND 8" INCLUDING ADMIXTURE AT THE POINT OF DELIVERY. IN THE ABSENCE OF PLASTICIZER AND WATER REDUCER, SLUMP AT THE POINT OF DELIVERY SHALL NOT EXCEED 4".
   c. W/C RATIO INDICATES WATER TO CEMENTITIOUS MATERIALS RATIO.
   d. SLABS ON GRADE, TOPPING SLABS, AND ELEVATED CONCRETE FLOORS SHALL HAVE A MAXIMUM SHRINKAGE RATE OF 0.04% AT 28 DAYS PER ASTM C157 (CURING TEST SPECIMENS TO BE CONSISTENT WITH FIELD CONDITIONS), OR USING EMBEDDED VIBRATING WIRE STRAIN GAUGES. RESULTS OF TESTING SHALL BE SUBMITTED TO ENGINEER.
   e. SEE ACI 318 FOR ADDITIONAL REQUIREMENTS REGARDING MAXIMUM AGGREGATE SIZE. AGGREGATE GRADATION OF 3/8" MAXIMUM (PEA GRAVEL) SHALL NOT BE USED WHERE FINISHED CONCRETE SURFACE IS EXPOSED TO VIEW.
5. CONCRETE MIX DESIGN AND TESTING SHALL MEET THE REQUIREMENTS OF THE BUILDING CODE AND SPECIFICATIONS. ALL CONCRETE MIXES SHALL BE DESIGNED PER ACI 318 BY A RECOGNIZED TESTING LAB STAMPED AND SIGNED BY A LICENSED ENGINEER AND SUBMITTED TO THE SEOR FOR REVIEW PRIOR TO CONCRETE PLACEMENT.
6. AGGREGATES IN NORMALWEIGHT CONCRETE SHALL CONFORM TO ASTM C33 (HARDROCK). AGGREGATES IN LIGHTWEIGHT CONCRETE SHALL CONFORM TO ASTM C330.
7. COMPRESSIVE STRENGTH TEST REPORTS SHALL BE SUBMITTED TO THE BUILDING DEPARTMENT AND THE SEOR.
8. PORTLAND CEMENT SHALL BE TYPE II AND SHALL CONFORM TO ASTM C150, LOW ALKALI. MILL TESTS WITH CERTIFICATES OF COMPLIANCE SHALL BE SUBMITTED.
9. FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618 CLASS F MAY BE USED AS A PARTIAL SUBSTITUTION FOR PORTLAND CEMENT UP TO A MAXIMUM OF 25% TOTAL CEMENTITIOUS MATERIALS BY WEIGHT IF THE MIX DESIGN IS PROPORTIONED BY FIELD EXPERIENCE OR TRIAL MIXTURES.
10. CONCRETE MIXING OPERATIONS, ETC. SHALL CONFORM TO ASTM C94.
11. LEAN CONCRETE, WHERE SPECIFICALLY INDICATED, SHALL CONTAIN 2 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
12. DRYPACK OR NONSHRINK GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI, AND CONSIST OF MASTERFLOW 713, EUCON NS GROUT, SIKA GROUT 212, OR APPROVED EQUAL. FOR THICK GROUT LAYERS FOLLOW MANUFACTURER'S GUIDELINES TO ATTAIN THE REQUIRED STRENGTH, WHICH MAY INCLUDE THE ADDITION OF PEA GRAVEL. FOR BASE PLATES LARGER THAN 6 SQUARE FEET, USE HI-FLOW GROUT OR MASTERFLOW 928.
13. DO NOT USE ANY CONCRETE OR GROUT CONTAINING CHLORIDES.
14. WATER USED IN MIX SHALL BE CLEAN AND POTABLE.
15. PRIOR TO ERECTING ANY ELEMENTS THAT LOAD THE FOUNDATION, CONCRETE MUST REACH AN UNCONFINED COMPRESSIVE STRENGTH OF 2000 PSI MINIMUM AS DETERMINED BY TESTING OR PREVIOUSLY DOCUMENTED DATA FOR THE MIX DESIGN USED UNDER SIMILAR CONDITIONS, AND MUST CURE FOR A MINIMUM OF 3 DAYS.
16. MAINTAIN CONCRETE ABOVE 50 DEGREES FAHRENHEIT AND IN A MOIST CONDITION FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT UNLESS OTHERWISE ACCEPTED BY SEOR.
17. SEE ARCHITECTURAL DRAWINGS FOR WALL OPENINGS, WALL OFFSETS, CHAMFERS, KERFS, DRIPS AND FOR EXTENT OF DEPRESSIONS, RAMPS, ETC.
18. PROVIDE SLEEVES FOR ALL PIPES THROUGH CONCRETE WALLS AND FOOTINGS SHOWN ON THESE DRAWINGS. CORING IS NOT PERMITTED WITHOUT PRIOR APPROVAL BY THE SEOR.
19. EXPOSED CORNERS OF SLABS, BEAMS, WALLS, COLUMNS, ETC. SHALL BE FORMED WITH 3/4" CHAMFER OR 1/2" RADIUS TOOLED EDGE, UNO.
20. BEAM LONGITUDINAL BARS SHALL BE ON INSIDE FACE OF COLUMN VERTICAL BARS.

HIGH-STRENGTH BOLTS

1. JOINT ASSEMBLIES USING HIGH-STRENGTH BOLTS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE "AISC (RCSC) SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS".
2. ALL HIGH-STRENGTH BOLTS SHALL CONFORM TO ASTM F3125 GRADE A325 OR A490, OR GRADE F1852, TYPE 1, W/ THREADS INCLUDED (N).
3. NUTS SHALL CONFORM TO ASTM A563 AND WASHERS SHALL CONFORM TO ASTM F436.
4. PAINT IS PROHIBITED ON CONTACT SURFACES UNLESS NOTED OTHERWISE. CONTACT SURFACES OF BOLTED PARTS SHALL BE DESCALED AND FREE OF DIRT, OIL, BURRS, PITS, AND OTHER DEFECTS WHICH PREVENT SOLID SEATING OF PARTS.
5. ALL HIGH-STRENGTH BOLTS SHALL BE TIGHTENED TO THE AISC SNUG TIGHT CONDITION UNLESS SPECIFIED AS SLIP-CRITICAL.
6. BOLTS IN "X" CONNECTIONS SHALL HAVE THE THREADS EXCLUDED FROM THE SHEAR PLANE. BOLTS IN "N" CONNECTIONS MAY HAVE THE THREADS INCLUDED IN THE SHEAR PLANE. CONNECTION TYPES ARE INDICATED AFTER THE BOLT GRADE (A325X FOR EXAMPLE). HIGH-STRENGTH BOLTS ARE "N" BEARING CONNECTIONS, UNLESS NOTED OTHERWISE.
7. SLIP-CRITICAL BOLTS SHALL HAVE CLASS "A" FAYING SURFACES. SLIP-CRITICAL JOINT ASSEMBLIES SHALL BE FULLY PRE-TENSIONED BY TURN-OF-NUT TIGHTENING, TENSION CONTROL CALIBRATED WRENCH TIGHTENING, TWIST-OFF BOLTS CONFORMING TO ASTM F3125 GRADE F1852, OR BY DIRECT TENSION INDICATOR TIGHTENING CONFORMING TO ASTM F959.

WELDING

1. WELDING PROCEDURES, ELECTRODES AND WELDER QUALIFICATIONS SHALL CONFORM TO AWS AND AISC REQUIREMENTS.
2. ALL WELDERS SHALL HAVE EVIDENCE OF PASSING THE AWS STANDARD QUALIFICATION TESTS, AND SHALL BE CERTIFIED FOR THE WORK THEY ARE PERFORMING.
3. PROJECT WELDING SHALL BE PERFORMED ONLY IN ACCORDANCE WITH WELDING PROCEDURE SPECIFICATIONS (WPS) SUBMITTED BY THE CONTRACTOR AND REVIEWED BY THE SEOR AND PROJECT WELDING INSPECTOR. THE WPS SHALL BE IN ACCORDANCE WITH THE APPLICABLE AWS.
4. WELDING OF STRUCTURAL STEEL SHALL BE PERFORMED PER AWS D1.1 USING E70XX ELECTRODES UNLESS OTHERWISE NOTED.
5. ALL FULL PENETRATION WELDS SHALL BE ULTRA-SONIC TESTED PER AWS D1.1 AND D1.8 REQUIREMENTS AS APPLICABLE.
6. ALL GROOVE OR BUTT WELDS SHALL BE COMPLETE PENETRATION WELDS, UNO. ALL EXPOSED BUTT WELDS SHALL BE GROUND SMOOTH.
7. ALL EXPOSED WELDS ON ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS) SHALL COMPLY WITH AISC CODE OF STANDARD PRACTICE, SECTION 10.
8. FIELD WELDS HAVE BEEN INDICATED WHERE THEY ARE EXPECTED TO OCCUR. THE CONTRACTOR SHALL DETERMINE THE ACTUAL FIELD WELDING NECESSARY TO COMPLETE THE PROJECT AND INCLUDE ALL ASSOCIATED COSTS WITHIN THE BASE BID.
9. ALL SPECIFIED FILLET WELD SIZES ARE MINIMUM SIZES. INCREASE WELDS TO AISC MINIMUM SIZES BASED ON THICKNESSES OF MATERIALS JOINED.

POST-INSTALLED ANCHORS AND DOWELS

UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE FOLLOWING APPLIES TO ALL POST-INSTALLED ANCHORS INTO HARDENED CONCRETE OR MASONRY, WHICH INCLUDES TYPES SUCH AS EXPANSION, WEDGE, SLEEVE, ADHESIVE/EPOXY, SHOT-PIN, SCREW AND UNDERCUT.

1. INSTALL PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII) EXCEPT AS OTHERWISE STATED IN THE SPECIFIED PRODUCT REPORTS. USE INSTALLATION PROCEDURES FOR CRACKED CONCRETE CONDITIONS. DO NOT USE CORE DRILL BITS FOR ANCHOR HOLES WITHOUT PRIOR SEOR APPROVAL. COPIES OF INSTALLATION INSTRUCTIONS SHALL BE MAINTAINED ON SITE.
2. CLEAN OUT ANCHOR HOLES AND SET ANCHORS PER THE PRODUCT'S THIRD PARTY EVALUATION REPORT FOR THE APPROPRIATE CONDITIONS. INSTALL UNDER SUPERVISION OF THE SPECIAL INSPECTOR WHERE REQUIRED.
3. PROVIDE CARBON STEEL ANCHORS AT DRY INTERIOR LOCATIONS AND STAINLESS STEEL TYPE 304 OR 316 AT EXTERIOR LOCATIONS AND DAMP INTERIOR LOCATIONS.
4. REINFORCING BARS TO RECEIVE CONCRETE COVER MAY BE UNCOATED.
5. ANCHORS SHALL BE CLEAN AND FREE OF DEBONDING SUBSTANCES.
6. EMBEDMENT REFERS TO THE FINAL INSTALLED EFFECTIVE DEPTH "hef" AS DEFINED IN THE PRODUCT REPORT. REQUIRED ANCHOR HOLE DEPTH FOR INSTALLATION MAY BE DEEPER.
7. EXISTING REINFORCING SHALL BE AVOIDED WHERE DRILLING FOR POST-INSTALLED ANCHORS OR CONCRETE DOWELS.
8. MAINTAIN A MINIMUM OF 2 INCHES FROM EXISTING CONDUIT AND POST-TENSIONING (WHERE OCCURS) PRIOR TO DRILLING, CORING, OR SHOOTING PINS INTO EXISTING CONCRETE OR MASONRY. USE NONDESTRUCTIVE TESTING TO LOCATE SUCH ITEMS.
9. WHERE THE FULL ANCHOR EMBEDMENT DEPTH, SPACING OR EDGE DISTANCE CANNOT BE ACHIEVED, NOTIFY THE SEOR AND IOR.
10. FILL ABANDONED HOLES WITH NON-SHRINK GROUT OR EPOXY. CLEAR DISTANCE BETWEEN NEW HOLES AND ABANDONED HOLES SHALL BE 2" OR TWO ANCHOR DIAMETERS, WHICHEVER IS GREATER, UNLESS OTHERWISE SPECIFIED BY SEOR. ANCHORS PENETRATING THROUGH WATERPROOFING OR VAPOR MEMBRANES SHALL BE SEALED OR FLASHED.
11. INSTALL IN DRY CONCRETE OR MASONRY HAVING A MINIMUM AGE OF 21 DAYS.
12. RE-USE OF SCREW ANCHORS AND SCREW ANCHOR HOLES IS NOT PERMITTED.
13. AN ACI-CRSI CERTIFIED ADHESIVE ANCHOR INSTALLER IS REQUIRED FOR THE INSTALLATION OF ADHESIVE ANCHORS IN HORIZONTAL AND OVERHEAD CONDITIONS.

REINFORCING STEEL

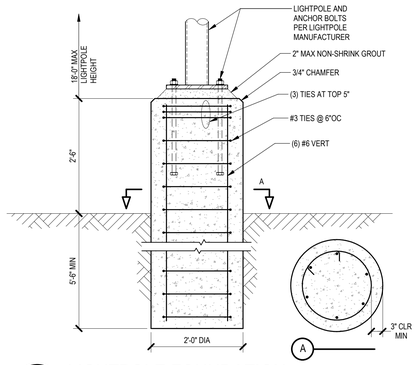
1. REINFORCING GRADES FOR CONCRETE AND MASONRY:

ALL BARS UNLESS NOTED OTHERWISE	ASTM A615 OR A706, GRADE 60
TIES AND STIRRUPS	ASTM A615 OR A706, GRADE 60
WELDED WIRE FABRIC	ASTM A1064
ALL BARS TO BE WELDED	ASTM A706, GRADE 60

2. ALL BARS SHALL BE DEFORMED.
3. MAINTAIN CONCRETE COVER FROM FACE OF CONCRETE TO EDGE OF ALL REINFORCEMENT AS FOLLOWS (UNO). THE INTENT IS FOR REINFORCEMENT TO BE PLACED SO THAT IT IS AS CLOSE TO CONCRETE SURFACES AS POSSIBLE, WITHIN SPECIFIED TOLERANCES, WHILE MAINTAINING THIS MINIMUM PROTECTION. PROVIDE THE LARGEST COVER REQUIRED FOR ALL APPLICABLE CONDITIONS. WHERE #3 STIRRUPS OR TIES ARE USED, ENSURE THAT THE COVER FOR LONGITUDINAL BARS IS ADEQUATE.

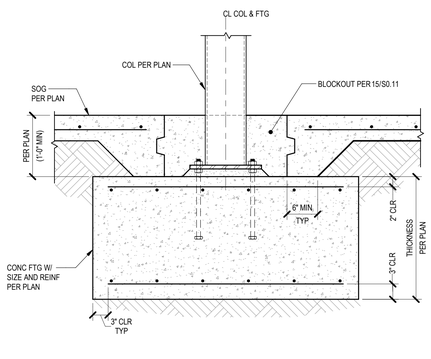
CONDITION	COVER
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
FORMED AND EXPOSED TO EARTH OR WEATHER	
#6 BARS AND LARGER	2"
#5 BARS AND SMALLER	1 1/2"
UNEXPOSED RAISED SLABS AND WALL FACES (#11 BARS AND SMALLER)	3/4"
UNEXPOSED COLUMNS AND BEAMS	1 1/2"
STRUCTURAL SLABS ON GRADE	
FROM BOTTOM OF SLAB	2"
FROM TOP OF SLAB	1 1/2"
OTHER CONCRETE NOT EXPOSED TO EARTH OR WEATHER (#11 BARS AND SMALLER)	3/4"

4. "CLEAR" OR "CLR" INDICATES DISTANCE BETWEEN SURFACES AND DOES NOT INDICATE MINIMUM UNLESS SPECIFICALLY NOTED AS SUCH. CLEAR DISTANCES ARE SUBJECT TO TOLERANCES PER CRSI.
5. REINFORCEMENT SHALL BE PLACED IN ACCORDANCE WITH THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) "MANUAL OF STANDARD PRACTICE". EACH REINFORCING BAR SHALL BE WIRED TO A CROSS BAR AT A MAXIMUM SPACING OF 24"OC. PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING IN POSITIONS SHOWN ON THE PLANS. DO NOT USE WOOD OR BRICK TO SUPPORT REINFORCING.
6. UNLESS OTHERWISE NOTED, REINFORCEMENT SHALL BE EQUALLY SPACED.
7. SPLICES IN CONTINUOUS REINFORCEMENT IN WALLS, FOOTINGS, ETC. SHALL HAVE A CLASS "B" LAP (1'-6" MIN) AND THE SPLICES IN ADJACENT BARS WITHIN THE SAME LAYER SHALL BE STAGGERED. VERTICAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LEVELS. BARS MAY BE WIRED TOGETHER AT SPLICES OR LAPS EXCEPT FOR TOP REINFORCING OF BEAMS AND SLABS OR WHERE SPECIFICALLY DETAILED TO BE SEPARATED. WELDED WIRE FABRIC SHALL BE LAPPED 12" MINIMUM.
8. ALL DOWELS, ANCHOR BOLTS AND OTHER HARDWARE TO BE SET IN CONCRETE SHALL BE TIED IN PLACE PRIOR TO PLACEMENT OF CONCRETE. NO WET SETTING, STABBING, RODDING OR OTHER MOVEMENT OF EMBEDDED ITEMS SHALL BE PERFORMED DURING PLACEMENT OF CONCRETE.
9. BEND REINFORCING BARS COLD. BARS MAY ONLY BE BENT ONCE.
10. REINFORCEMENT SHALL BE FREE FROM MUD, OIL, DIRT, LOOSE RUST, MORTAR, PAINT, GREASE AND OTHER NON-METALLIC AGENTS THAT REDUCE BOND CAPACITY. BONDED RUST OR MILL SCALE IS ACCEPTABLE PROVIDED THE MINIMUM CROSS-SECTIONAL AREA (INCULDING HEIGHT OF DEFORMATIONS) AND WEIGHT ARE MAINTAINED.
11. DOWELS BETWEEN FOOTING AND WALLS OR COLUMNS SHALL BE THE SAME GRADE, SIZE AND SPACING AS THE MAIN REINFORCING UNO.
12. ALL BARS SHALL BE MARKED SO THEIR IDENTIFICATION CAN BE MADE DURING INSPECTION.
13. CHAIRS OR SPACERS FOR REINFORCING SHALL BE PLASTIC WHEN RESTING ON EXPOSED SURFACES.
14. WHERE LONGITUDINAL REINFORCING BARS ARE PLACED IN 2 OR MORE LAYERS, BARS IN THE UPPER LAYERS SHALL BE PLACED DIRECTLY ABOVE BARS IN THE BOTTOM LAYER WITH A CLEAR SPACING BETWEEN LAYERS OF 1" MINIMUM.
15. ALL BENDS WITHIN STIRRUPS, HOOPS, AND CROSS-TIES SHALL ENGAGE A LONGITUDINAL BAR. PROVIDE #4 SPACER BAR WHERE A LONGITUDINAL BAR IS NOT SPECIFICALLY DETAILED.
16. MECHANICAL BAR SPLICES (COUPLERS) MAY BE USED AT CONTRACTOR'S OPTION IN LIEU OF LAP SPLICES AND WHERE REBAR IS SHOWN CONTINUOUS. UNLESS NOTED OTHERWISE, ALL MECHANICAL BAR SPLICES SHALL BE "TYPE 2" AS DEFINED IN ACI 318 AND AS LISTED IN THE PRODUCT SCHEDULE, AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
17. MECHANICAL HEADED END ANCHORS MAY BE USED AT CONTRACTOR'S OPTION IN LIEU OF STANDARD 90 DEGREE HOOKS AS LISTED IN THE PRODUCT SCHEDULE, AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE HEADED END ANCHORS WHERE CONGESTION DOES NOT ALLOW HOOKED REBAR INSTALLATION.
18. WELDING OF REINFORCING BARS SHALL BE PERFORMED PER AMERICAN WELDING SOCIETY (AWS) D1.4 USING E90XX ELECTRODES FOR A615 REINFORCING AND E80XX ELECTRODES FOR A706 REINFORCING.
19. (SPECIAL SYSTEMS) THE FOLLOWING REINFORCEMENT SHALL COMPLY WITH ASTM A706 (OR, ASTM A615 MAY BE USED IF THE BARS COMPLY WITH



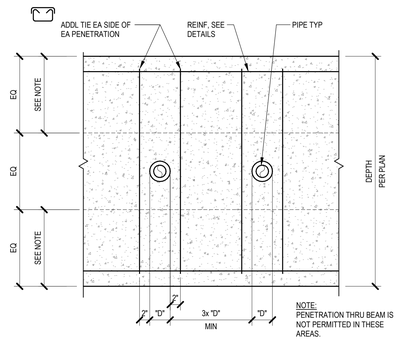
17 LIGHTPOLE FOUNDATION

NTS 033100_01-0111



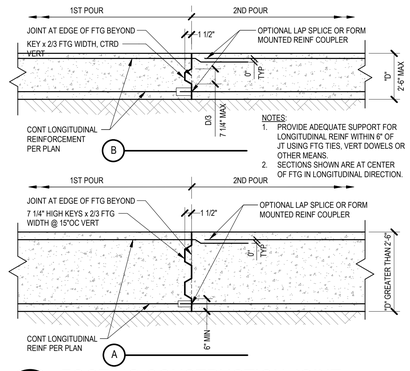
13 STEEL COLUMN TO PAD FOOTING

NTS 033100_01-0103



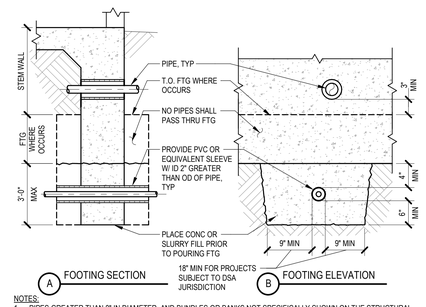
9 PIPING & CONDUIT THRU GRADE BEAM

NTS 033100_00-0103



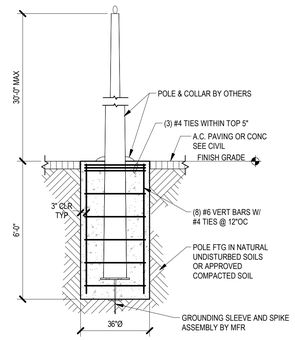
5 FOOTING CONSTRUCTION JOINT

NTS 033100_01-0104



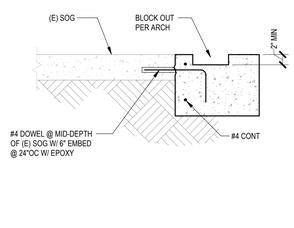
1 PIPE THROUGH STEM WALL OR BELOW FOOTING

NTS 033100_00-0101



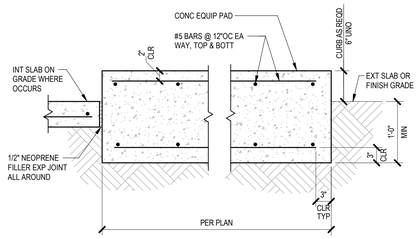
18 FLAG POLE FOOTING

NTS



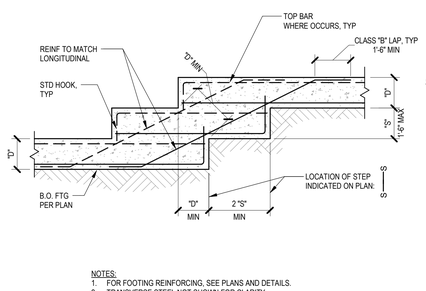
14 EDGE OF SLAB TO (E) SLAB

1" = 1'-0"



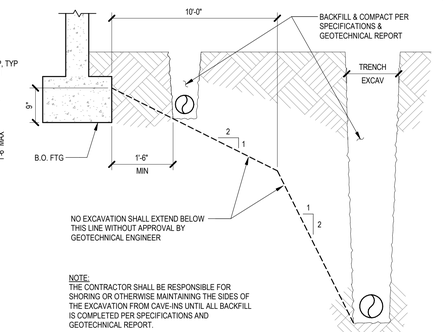
10 ISOLATED EQUIPMENT PAD

NTS 033053_01-0101



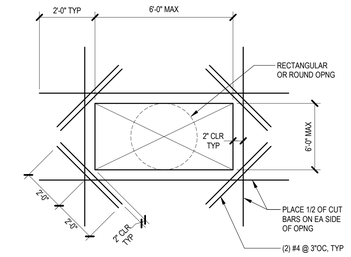
6 STEPPED FOOTING

NTS 033100_01-0100



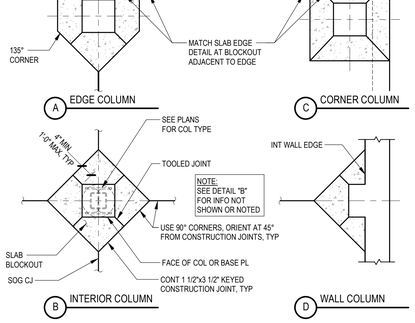
2 EXCAVATION PARALLEL TO FOOTINGS

NTS 033100_00-0102



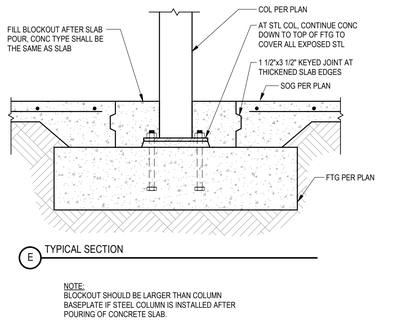
19 OPENING IN SLAB ON GRADE

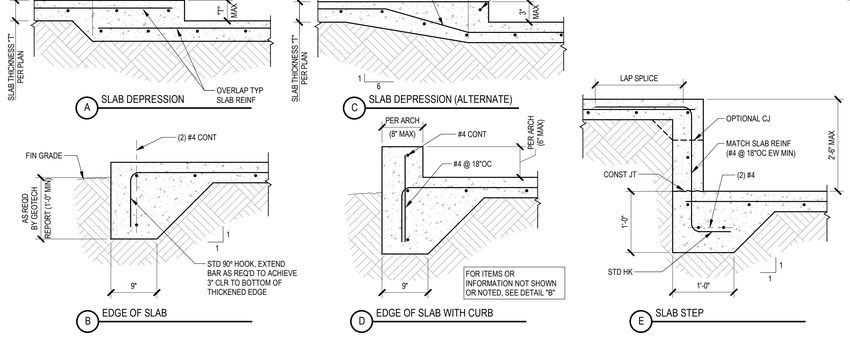
NTS 033100_03-0103



15 SLAB BLOCKOUT AT COLUMNS

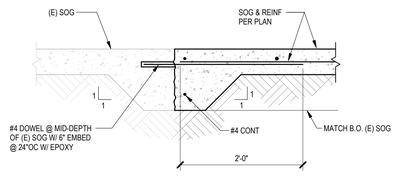
NTS 033100_03-0101





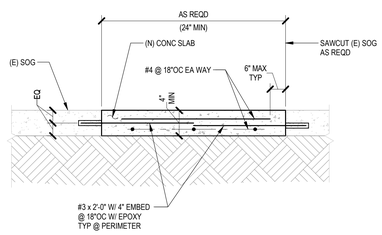
7 SLAB ON GRADE DETAILS

NTS 033100_03-0100



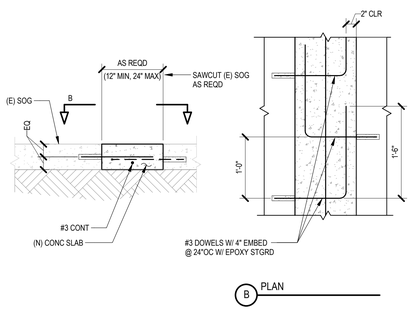
20 EDGE OF SLAB TO (E) SLAB

NTS 030000-0103



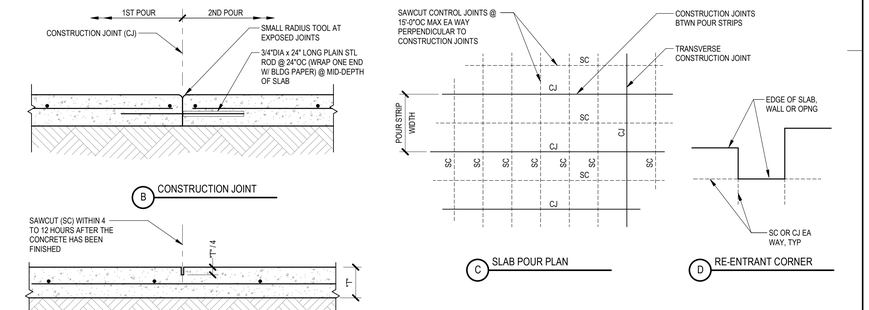
16 INTERIOR SAWCUT IN (E) SLAB

NTS 030000-0106



12 NARROW INTERIOR SAWCUT IN (E) SLAB

NTS 030000-0107



8 SLAB ON GRADE CONTROL JOINTS

NTS 033100_03-0102

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
T: (800) 270-9648
miyamotointernational.com
M0220600.00 - v20

LICENSED PROFESSIONAL ENGINEER — PETCOFF, WILLIAM — C 69880 — CIVIL — STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

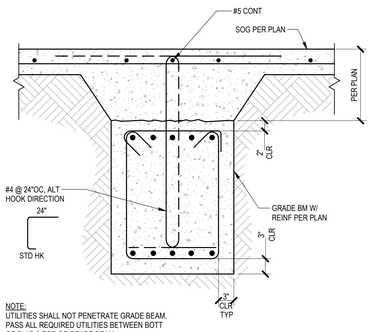
TYPICAL FOUNDATION & SOG DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S0.11

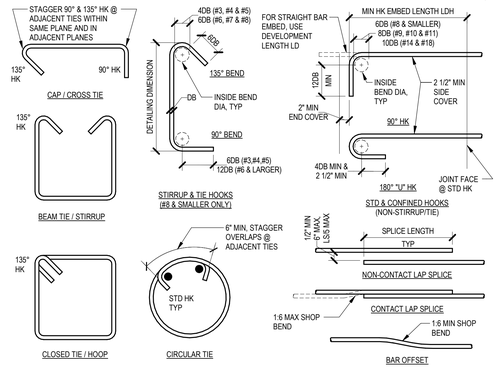
11/6/2024 4:39:30 PM



NOTE:
UTILITIES SHALL NOT PENETRATE GRADE BEAM. PASS ALL REQUIRED UTILITIES BETWEEN BOTT OF SLAB & TOP OF GRADE BEAM.

9 GRADE BEAM TO SLAB

NTS 033100.02-0101

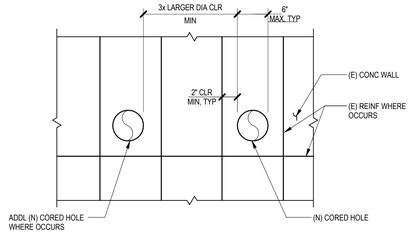


	BAR SIZE	STD HOOK DEVELOPMENT LENGTH 'LDH' (IN)	CLASS B LAP SPLICE 'LS' (IN)		DEVELOPMENT LENGTH 'LD' (IN)	
			BOTT	TOP	BOTT	TOP
3000 PSI NWC	#3	6	22	28	17	22
	#4	8	29	37	22	29
	#5	10	36	47	28	36
	#6	12	43	56	33	43
	#7	14	63	81	48	63
	#8	16	72	93	55	72
	#9	18	81	105	62	81
	#10	20	91	118	70	91
	#11	22	101	131	78	101
4000 PSI NWC	#3	6	19	24	15	19
	#4	7	25	32	19	25
	#5	9	31	40	24	31
	#6	10	37	48	29	37
	#7	12	54	70	42	54
	#8	14	62	80	48	62
	#9	15	70	91	54	70
	#10	17	79	102	61	79
	#11	19	87	113	67	87
5000 PSI NWC	#3	6	17	22	13	17
	#4	6	22	29	17	22
	#5	8	28	36	22	28
	#6	9	33	43	26	33
	#7	11	49	63	37	49
	#8	12	55	72	43	55
	#9	14	63	81	48	63
	#10	15	70	91	54	70
	#11	17	78	101	60	78

NOTES:
1. SEE BUILDING CODE AND ACI FOR ALL REQUIREMENTS NOT NOTED.
2. FOR LIGHTWEIGHT CONCRETE, MULTIPLY LDH, LS AND LD VALUES BY 1.33.
3. "TOP" BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW BARS. ALL OTHER BARS ARE "BOTT" BARS.
4. WHERE REQUIRED LS CANNOT BE OBTAINED WITH STRAIGHT BARS, EXTEND REINFORCING AS FAR AS POSSIBLE (LDH MINIMUM) AND PROVIDE STANDARD HOOK. WHERE LDH CANNOT BE OBTAINED, CONTACT THE SEOR.
5. VALUES ARE FOR GRADE 60 (FY=60 KSI) REINFORCEMENT.
6. SPLICE LENGTHS ARE FOR CLEAR SPACING NOT LESS THAN 2DB AND CONCRETE COVER NOT LESS THAN DB.
7. FOR EPOXY-COATED AND/OR BUNDLED REINFORCEMENT, CONTACT THE SEOR.
8. WHERE BARS OF DIFFERENT SIZES ARE LAP SPLICED IN TENSION, SPLICE LENGTH SHALL BE THE LARGER OF LD OF THE LARGER BAR AND LS OF THE SMALLER BAR.
9. WHERE CLASS "A" LAP SPLICES ARE SPECIFICALLY INDICATED, USE 'LD'.

5 CONCRETE REINFORCEMENT DETAILS & DEVELOPMENT LENGTHS

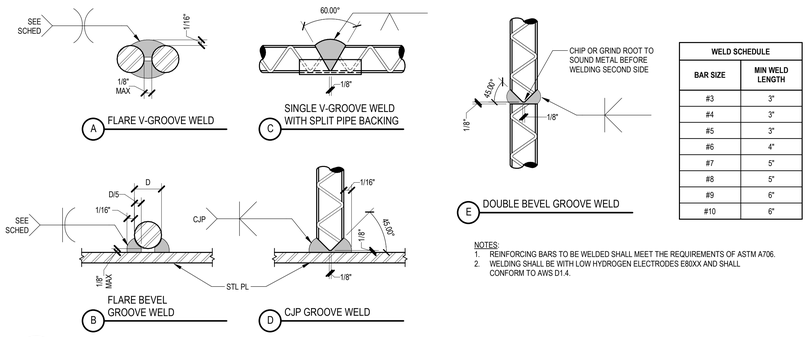
NTS 032000-0100



NOTES:
1. ALL CORED HOLE LOCATIONS SHALL BE REVIEWED AND APPROVED BY THE SEOR PRIOR TO CORING.
2. PROVIDE NONDESTRUCTIVE TESTING TO DETERMINE THE LOCATION OF (E) REINFORCING BARS PRIOR TO THE CORING OF (N) HOLES. LOCATE THE (N) CORED HOLES IN SUCH A MANNER TO AVOID CONTACT WITH (E) REINFORCING.

10 NEW CORED HOLES IN EXISTING CONC

NTS 030000-0101

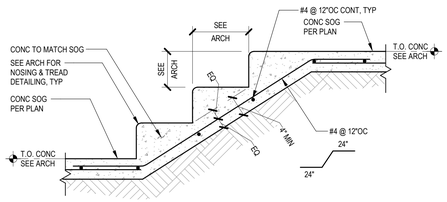


WELD SCHEDULE	
BAR SIZE	MIN WELD LENGTH
#3	3"
#4	3"
#5	3"
#6	4"
#7	5"
#8	5"
#9	6"
#10	6"

NOTES:
1. REINFORCING BARS TO BE WELDED SHALL MEET THE REQUIREMENTS OF ASTM A706.
2. WELDING SHALL BE WITH LOW HYDROGEN ELECTRODES E80XX AND SHALL CONFORM TO AWS D1.4.

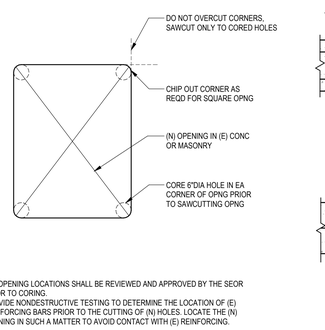
6 REINFORCING BAR WELDING

NTS 032000-0101



11 INTERIOR STAIR ON GRADE

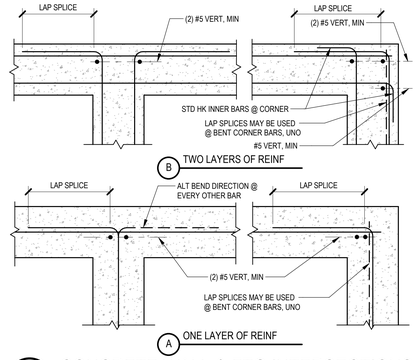
NTS 033053.02-0102



NOTES:
1. ALL OPENING LOCATIONS SHALL BE REVIEWED AND APPROVED BY THE SEOR PRIOR TO CORING.
2. PROVIDE NONDESTRUCTIVE TESTING TO DETERMINE THE LOCATION OF (E) REINFORCING BARS PRIOR TO THE CUTTING OF (N) HOLES. LOCATE THE (N) OPENING IN SUCH A MATTER TO AVOID CONTACT WITH (E) REINFORCING.

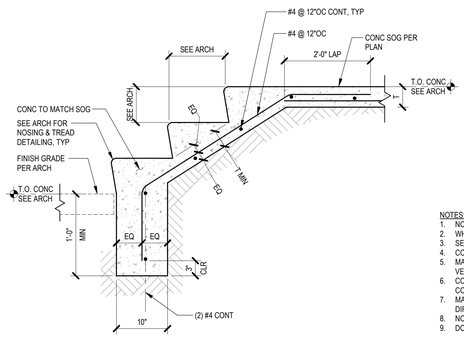
7 SAWCUT OPENING

NTS 030000-0100



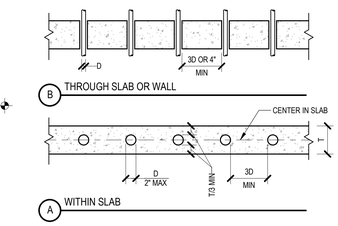
3 CONCRETE WALL & FTG INTERSECTIONS

NTS 032000-0102



12 STAIR ON GRADE

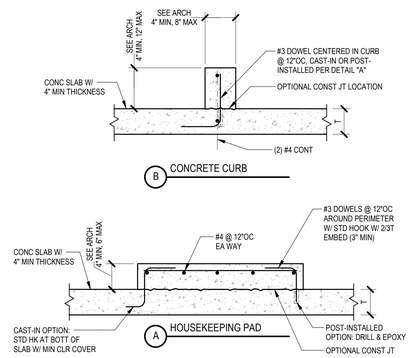
NTS 033053.02-101



NOTES:
1. NO CONDUIT/PIPES SHALL BE ALLOWED IN SLABS UNLESS "T" IS A MINIMUM OF 5".
2. WHERE CLEAR DISTANCE CANNOT BE ACHIEVED, THIS AREA SHALL BE TREATED AS A SLAB OPENING.
3. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATION.
4. CONDUIT SHALL BE 2'-0" MIN FROM PT TENDONS AND TENDON ANCHORAGE.
5. MAINTAIN A MINIMUM HORIZONTAL CLEARANCE FROM PARALLEL PT TENDONS OF 1'-0" AND A MINIMUM VERTICAL CLEARANCE OF 1" FROM PT TENDONS BEING CROSSED.
6. CONDUITS/PIPES SHALL BE ADEQUATELY SUPPORTED AND SECURED AGAINST DISPLACEMENT PRIOR TO CONCRETE PLACEMENT.
7. MAINTAIN ONE REBAR DIAMETER CLEAR BETWEEN CONDUIT/PIPES AND REBARS. DO NOT SET CONDUIT/PIPES DIRECTLY ON REBAR.
8. NO MORE THAN 5 PARALLEL CONDUITS MAY BE PLACED IN ANY 5'-0" WIDE STRIP OF CONCRETE.
9. DO NOT CUT/RELOCATE REBAR TO INSTALL CONDUIT OR PIPING.

8 PIPES/CONDUITS IN/THRU SLAB & WALL

NTS 033100_00-0100



4 CONCRETE PAD & CURB

NTS 033053_01-0100

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M0220600100 - v20

T: (909) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
FRANK J. PETCOFF
C 69888
CIVIL
STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024
SHEET TITLE:	

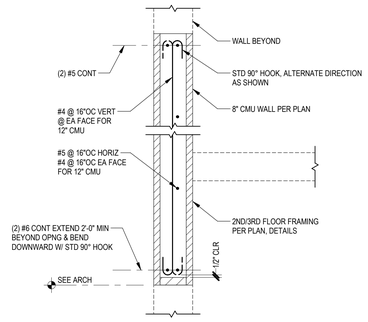
TYPICAL CONCRETE DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

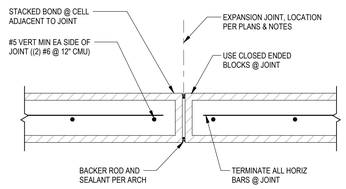
S0.13

11/6/2024 4:38:32 PM



13 TYPICAL SPANDREL

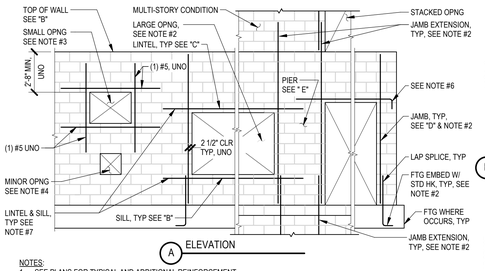
NTS



NOTE:
DO NOT SUBSTITUTE EXPANSION JOINTS FOR CONTROL JOINTS. USE ONLY WHERE SPECIFICALLY NOTED.

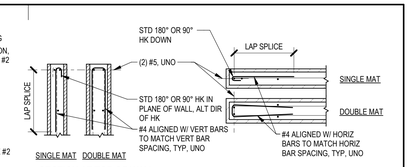
9 CMU WALL EXPANSION JOINT

NTS 042200-0104



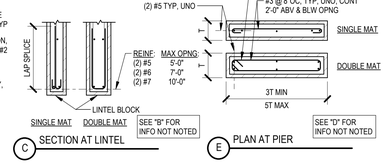
A ELEVATION

NOTES:
1. SEE PLANS FOR TYPICAL AND ADDITIONAL REINFORCEMENT.
2. FOR OPENINGS 36" OR LARGER IN WIDTH, USE FULL HEIGHT JAMB BARS. EXTEND TO TOP OF WALL AT UPPER OR SINGLE STORY, AND 48DB BELOW TOP OF FLOOR AND INTO FOOTING.
3. AT OPENINGS LESS THAN 36" IN WIDTH, EXTEND JAMB BARS 48DB PAST EDGE OF OPENING.
4. FOR MINOR OPENINGS THAT DO NOT INTERRUPT TYPICAL REINF, ARE NO LARGER THAN 24" SQ, AND ARE AT LEAST 24" FROM ADJACENT OPENINGS AND WALL ENDS, NO ADDITIONAL REINF IS REQUIRED UNO.
5. WHERE FULL EXTENSION IS NOT POSSIBLE, EXTEND BARS AS FAR AS POSSIBLE AND USE A STD HOOK.
6. EXTEND LINTEL AND SILL BARS 48DB MINIMUM PAST EDGE OF OPENING.
7. THE WEB AND SHELL MAY BE REMOVED TO FACILITATE INSTALLATION, IF REQUIRED, PROVIDED THAT GROUTING AND BLOCK INTEGRITY ARE NOT COMPROMISED.



B SECTION AT TOP OF WALL OR SILL

D PLAN AT JAMB

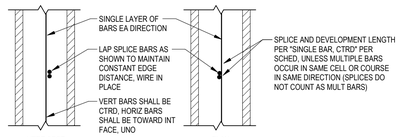


C SECTION AT LINTEL

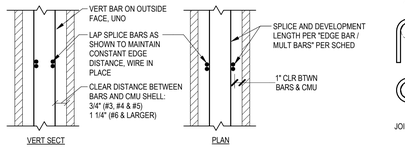
E PLAN AT PIER

5 REINFORCEMENT FOR CMU WALL OPENINGS

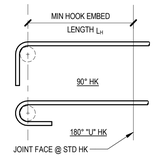
NTS 042200-0100



A REINFORCEMENT CENTERED IN CMU BLOCK



B REINFORCEMENT AT EDGE OF CMU BLOCK / MULTIPLE BARS



C STD HOOKS

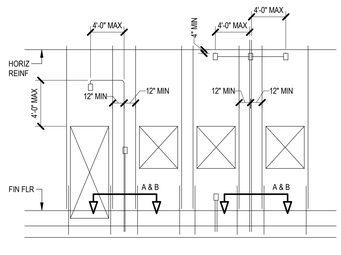
ALL CMU	BAR SIZE	STD HOOK L_{dh} (IN)	$72D_b$ (IN)	LAP SPLICE (IN) UNO	DEVELOPMENT LENGTH L_d (IN) UNO	
					EDGE BAR/ MULT BARS	SINGLE BAR, CTRD
	#3	11	27		16	15
	#4	14	36		25	20
	#5	17	45		39	25
	#6	30	54		54	39
	#7	39	63		63	50
	#8	59	72		72	72
	#9	66	81		81	81

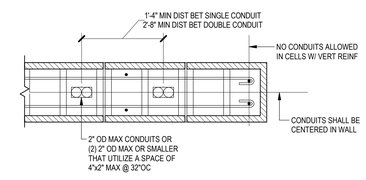
NOTES:
1. VALUES ARE FOR GRADE 60 REINF DEVELOPED IN CMU (f'm = 2000 PSI).
2. VALUES MAY NOT BE USED FOR DEVELOPMENT INTO CONCRETE.

6 CMU REINFORCEMENT DETAILS & DEVELOPMENT LENGTHS

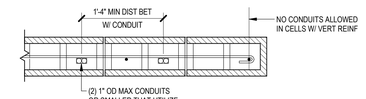
NTS 042200-0101

NOTES:
1. 1" O.D. MAX AT 8" WALLS.
   2" O.D. MAX AT 12" WALLS.
2. ONLY STEEL OR PVC, ALUMINUM CONDUITS ARE RESTRICTED FROM USE.
3. CONDUITS SHALL NOT BE ALLOWED IN ANY OF THE FOLLOWING CONDITIONS:
   A. ANY VERTICAL CELL CONTAINING REINFORCING.
   B. WITHIN 6" OF ANY HORIZONTAL BARS EXCEPT AT CROSSINGS.
4. NO JUNCTION BOXES ARE ALLOWED WHERE VERTICAL REBARS ARE SPACED AT 8"OC.
5. HORIZONTAL CONDUIT RUNS SHALL NOT EXCEED 4'-0".
6. CONDUITS SHALL NOT BE PLACED IN BOND BEAMS.
7. ALL HORIZONTAL CONDUITS SHALL BE A MINIMUM OF 6" AWAY FROM HORIZONTAL BARS.
8. STRUCTURAL ENGINEER RESERVES THE RIGHT TO MODIFY OR RESTRICT THE USE OF THESE RULES BASED ON ACTUAL FIELD CONDITIONS AND QUALITY EXECUTION.

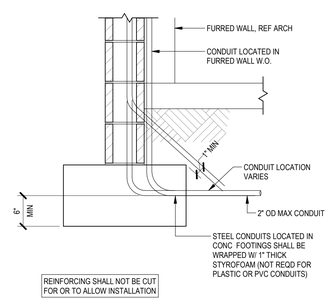




A CONDUIT PLACEMENT FOR 12" MASONRY WALLS

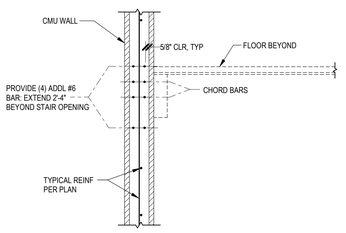


B CONDUIT PLACEMENT FOR 8" MASONRY OR CONC WALLS



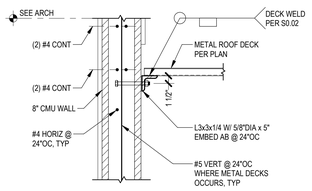
16 CONDUIT IN MASONRY WALLS

1" = 1'-0"



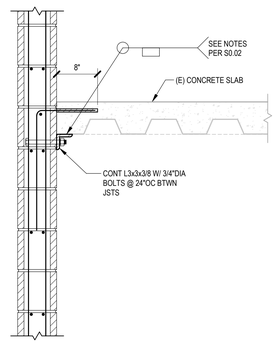
10 DETAIL FOR WALL AT STAIR OPENING

NTS



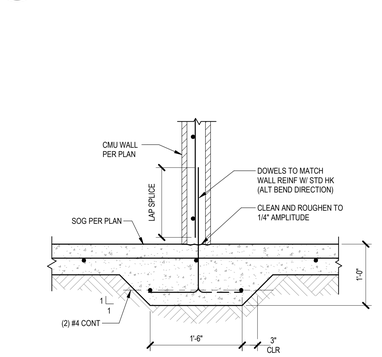
11 DETAIL

NTS



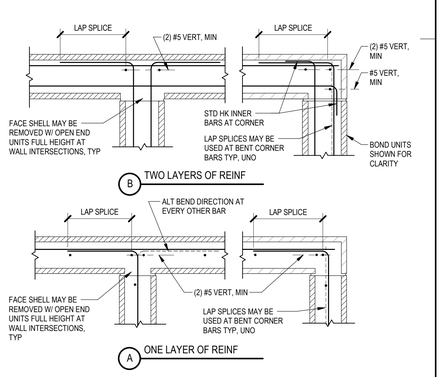
12 DETAIL

NTS



7 NON-BEARING CMU WALL FTG

NTS 042200-0108

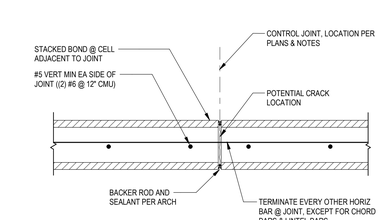


B TWO LAYERS OF REINF

A ONE LAYER OF REINF

3 CMU WALL INTERSECTIONS

NTS 042200-0107

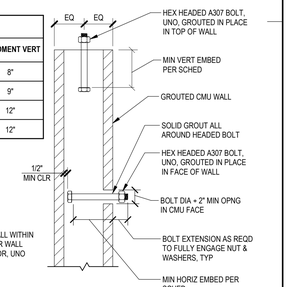


8 CMU WALL CONTROL JOINT

NTS 042200-0103

BOLT EMBED SCHEDULE		
BOLT SIZE	EMBEDMENT HORIZ	EMBEDMENT VERT
1/2"DIA	4"	8"
5/8"DIA	5"	9"
3/4"DIA	5"	12"
7/8"DIA*	7"	12"

* NOT ALLOWED IN 8" CMU



NOTE:
DO NOT PLACE BOLTS IN FACE OF WALL WITHIN 12 BOLT DIAMETERS OF OPENINGS OR WALL ENDS WITHOUT APPROVAL FROM SEOR, UNO

4 HEADED BOLT IN CMU WALL

NTS 042200-0105

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MS220601.00 - v20
T: (833) 270-6848
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — TRAVIS PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/05/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024
SHEET TITLE:	

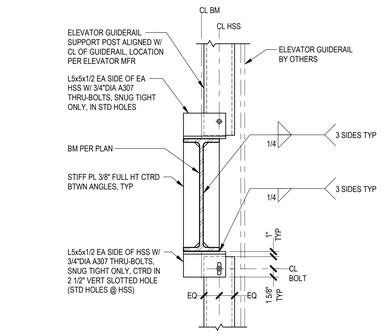
TYPICAL MASONRY DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

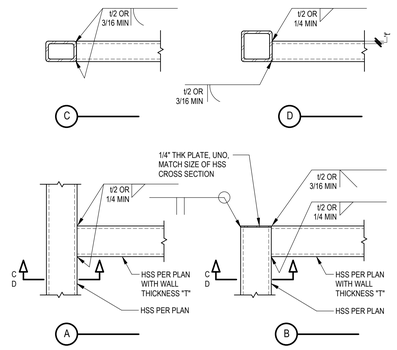
S0.21

11/6/2024 4:38:35 PM



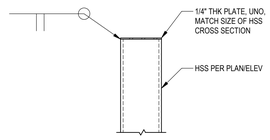
17 ELEVATOR GUIDERAIL SUPPORT POST

NTS 142000-0101



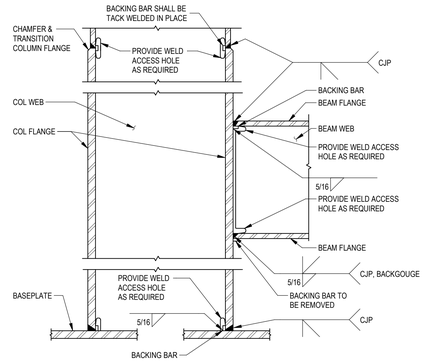
13 HSS TO HSS CONNECTIONS

NTS 051200_01-0108



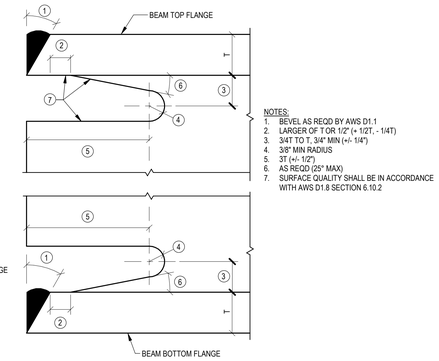
9 HSS CAP PLATE

NTS 051200_00-0105



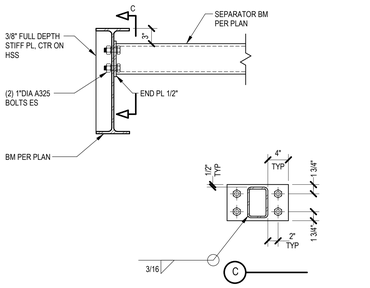
5 BACKING BAR WELDING

NTS 051200_00-0100

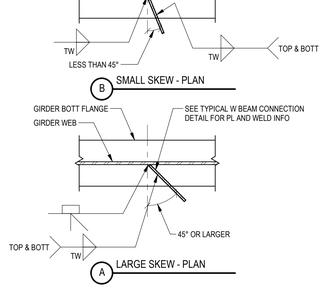


1 WELD ACCESS HOLE

NTS 051200_00-0101

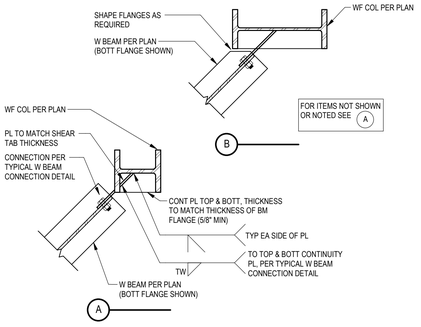


B CONNECTION TO STEEL BEAM



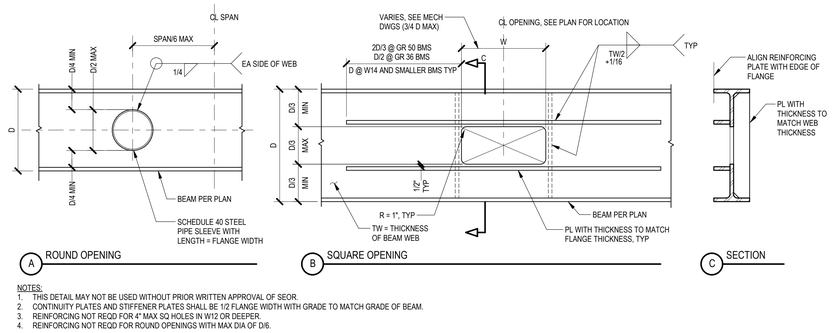
15 SKEWED BEAM TO BEAM CONNECTION

NTS 051200_02-0111



11 SKEWED W BEAM/COLUMN CONN

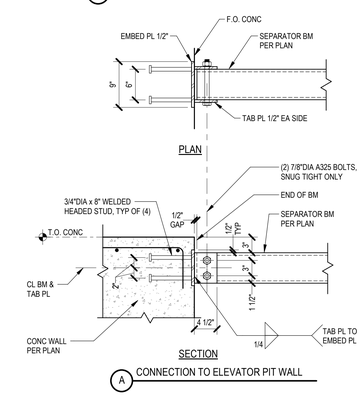
NTS 051200_01-0105



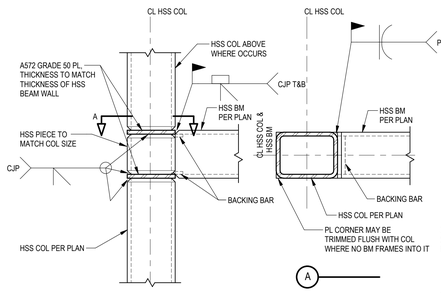
NOTES:
1. THIS DETAIL MAY NOT BE USED WITHOUT PRIOR WRITTEN APPROVAL OF SEOR.
2. CONTINUITY PLATES AND STIFFENER PLATES SHALL BE 1/2 FLANGE WIDTH WITH GRADE TO MATCH GRADE OF BEAM.
3. REINFORCING NOT REQD FOR 4" MAX SQ HOLES IN W12 OR DEEPER.
4. REINFORCING NOT REQD FOR ROUND OPENINGS WITH MAX DIA OF D/6.

7 HOLE THROUGH STEEL BEAM WEB

NTS 051200_02-0103

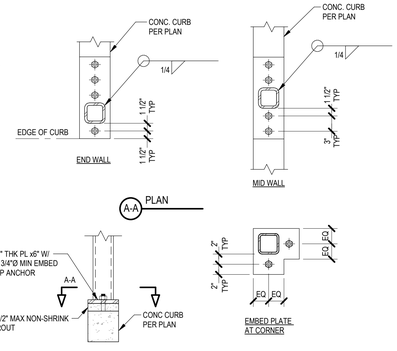


A CONNECTION TO ELEVATOR PIT WALL



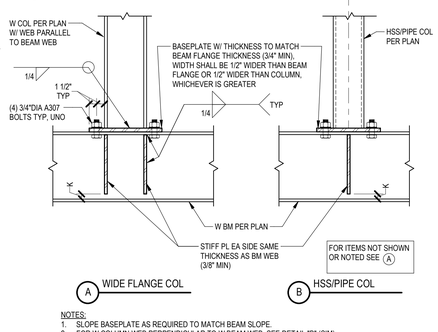
16 HSS BEAM TO HSS COLUMN MOMENT CONNECTION

NTS 051200_05-0104



12 COLUMN BASE PLATE

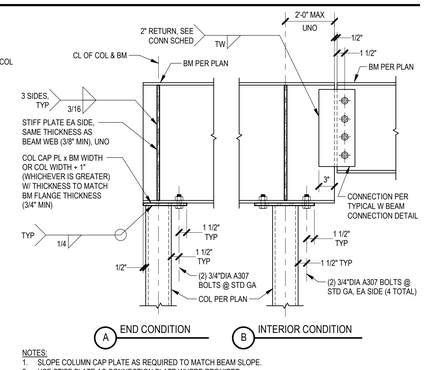
1" = 1'-0"



NOTES:
1. SLOPE BASEPLATE AS REQUIRED TO MATCH BEAM SLOPE.
2. FOR W COLUMN WEB PERPENDICULAR TO W BEAM WEB, SEE DETAIL "B" (SIM).

8 COLUMN SUPPORTED BY BEAM

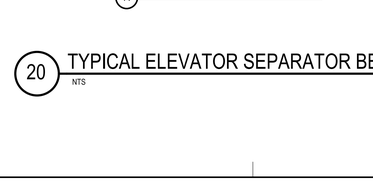
NTS 051200_01-0104



NOTES:
1. SLOPE COLUMN CAP PLATE AS REQUIRED TO MATCH BEAM SLOPE.
2. USE STIFF PLATE AS CONNECTION PLATE WHERE REQUIRED.
3. OFFSET STIFF PLATE AS REQUIRED AT BEAM CONNECTION.

4 BEAM TO TOP OF COLUMN

NTS 051200_02-0104



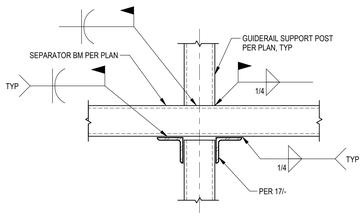
B CONNECTION TO STEEL BEAM

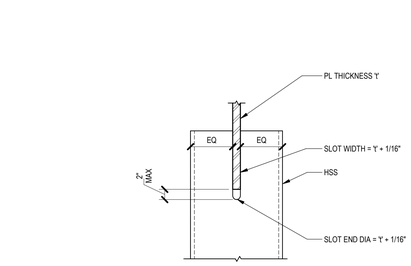
20 TYPICAL ELEVATOR SEPARATOR BEAM

NTS

18 ELEVATOR GUIDERAIL SUPPORT POST AT SEPARATOR BEAM

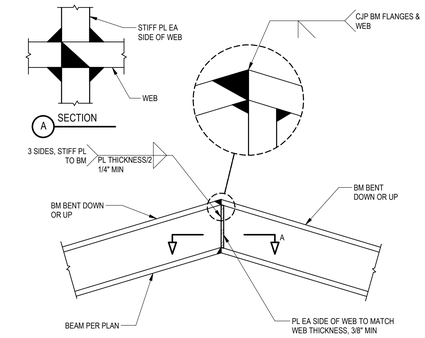
NTS





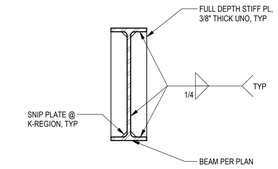
10 HSS SLOT

NTS 051200_00-0104



6 BENT BEAM

NTS 051200_02-0107



2 WEB STIFFENER

NTS 051200_00-0103

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO
miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA 91762
M0220601.00 - v20
T: (800) 270-6648
miyamotointernational.com

REGISTERED PROFESSIONAL ENGINEER — PETCOFF WILLIAM — C 69888 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 11-07-2024

SHEET TITLE:

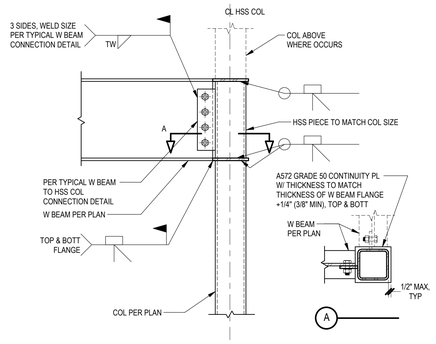
TYPICAL STRUCTURAL STEEL DETAILS

SCALE: As indicated

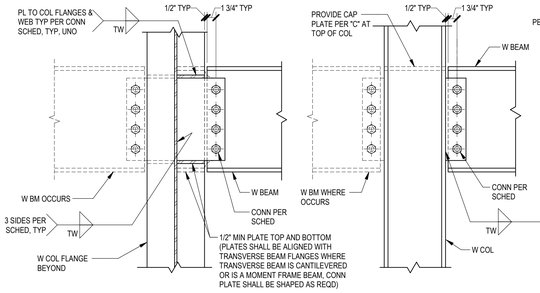
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S0.31

11/6/2024 4:38:39 PM

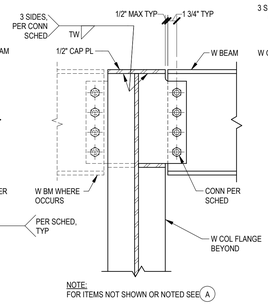


A



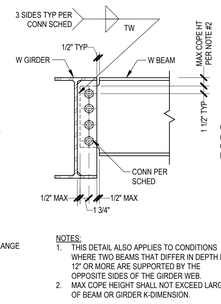
A BEAM TO COL WEB

B BEAM TO COL FLANGE



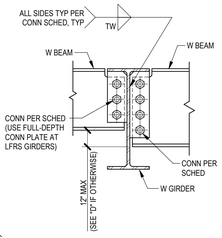
NOTE:
FOR ITEMS NOT SHOWN OR NOTED SEE A

C BEAM TO COL WEB AT TOP OF COL



NOTES:
1. THIS DETAIL ALSO APPLIES TO CONDITIONS WHERE TWO BEAMS THAT DIFFER IN DEPTH BY 12" OR MORE ARE SUPPORTED BY THE OPPOSITE SIDES OF THE GIRDER WEB.
2. MAX COPE HEIGHT SHALL NOT EXCEED LARGER OF BEAM OR GIRDER K-DIMENSION.

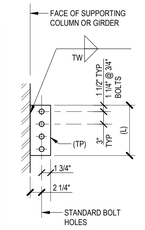
D BEAM TO GIRDER ONE SIDE



NOTES:
FOR ITEMS NOT SHOWN OR NOTED SEE D

E BEAM TO GIRDER EACH SIDE

CONNECTION SCHEDULE				
BEAM/GIRDER SIZE	QTY OF A325N BOLTS, UNO	(L) MIN PL AND WELD LENGTH	(TP) MIN PL THICKNESS	(TW) MIN WELD THICKNESS
W8	(2) 3/4"DIA	5 1/2"	3/8"	1/4"
W10	(2) 3/4"DIA	6"	3/8"	1/4"
W12	(3) 7/8"DIA	9"	3/8"	1/4"
W14	(3) 7/8"DIA	9"	3/8"	1/4"
W16	(4) 7/8"DIA	12"	3/8"	1/4"
W18	(5) 7/8"DIA	15"	3/8"	1/4"
W21	(6) 7/8"DIA	18"	3/8"	1/4"
W24	(6) 7/8"DIA	18"	1/2"	5/16"
W27	(7) 7/8"DIA	21"	1/2"	5/16"
W30	(8) 7/8"DIA	24"	1/2"	5/16"
W33	(9) 7/8"DIA	27"	1/2"	5/16"
W36	(10) 7/8"DIA	30"	1/2"	5/16"
W40	(11) 7/8"DIA	33"	1/2"	5/16"
W44	(12) 7/8"DIA	36"	1/2"	5/16"



F TYPICAL SHEAR TAB UNO

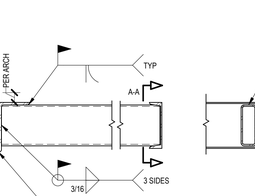
NOTE:
SEE STEEL LATERAL FORCE RESISTING SYSTEM NOTES FOR BOLT TYPE AT LFRS MEMBER CONNECTIONS, WHERE OCCURS.

17 W BEAM TO HSS COL MOMENT CONNECTION

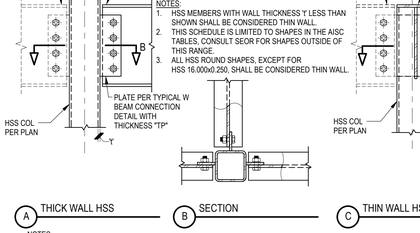
NTS 051200_01-0103

13 W BEAM TO W COL & GIRDER CONNECTIONS

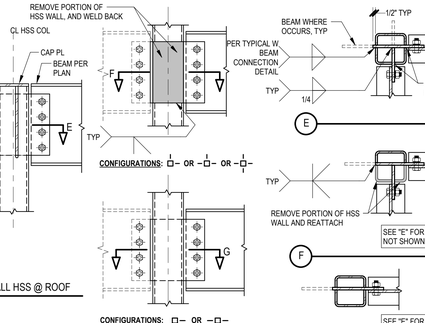
NTS 051200_02-0102



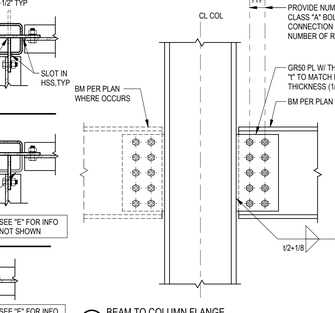
NOTE:
WHERE NUMBER OF REQUIRED BOLTS PER PLAN OR SCHEDULE IS MORE THAN NUMBER OF BOLTS THAT FIT IN ONE ROW, USE MAXIMUM BOLTS IN FIRST ROW & BALANCE IN SECOND ROW (2 BOLTS MIN IN SECOND ROW)



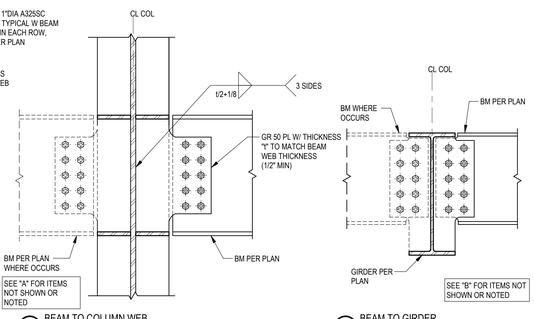
NOTES:
1. SEE PLAN FOR LOCATION, – – – –> ARROW INDICATES LOW END OF ANGLE.
2. WHERE SPACING IS NOT INDICATED ON PLAN, SPACE BRACING EQUALLY ALONG BEAM SPAN.



A CANTILEVER BEAM TO COLUMN FLANGE



B CANTILEVER BEAM TO COLUMN WEB

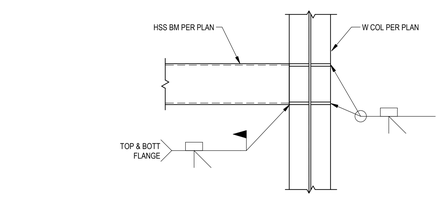


C CANTILEVER BEAM TO EQUAL DEPTH GIRDER

D CANTILEVER BEAM TO UNEQUAL DEPTH GIRDER

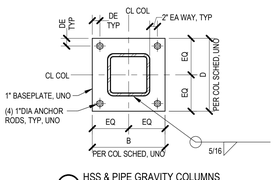
18 GIRDER SHALLOWER THAN BEAM

1" = 1'-0"

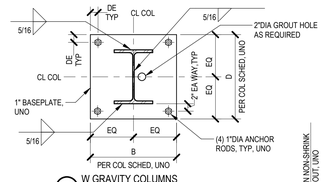


14 BOTTOM FLANGE KICKER

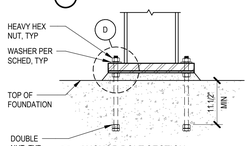
NTS 051200_02-0105



A HSS & PIPE GRAVITY COLUMNS

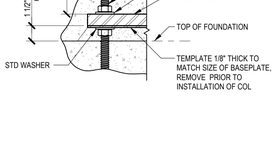


B W GRAVITY COLUMNS



C ANCHOR BOLT SECTION

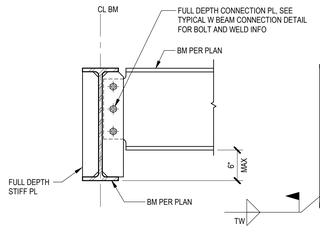
HOLE, EDGE DISTANCE & WASHER SCHEDULE				
BOLT DIAMETER	DE	HOLE DIAMETER	MIN WASHER SIZE	MIN WASHER THICKNESS
3/4"	1 1/4"	1 5/16"	2"	1/4"
7/8"	1 7/16"	1 9/16"	2 1/2"	5/16"
1"	1 5/8"	1 7/8"	3"	3/8"
1 1/4"	2"	2 1/8"	3 1/2"	1/2"



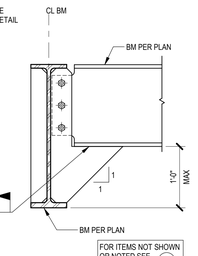
D ANCHOR BOLT PROJECTION

10 CANTILEVER CONNECTIONS

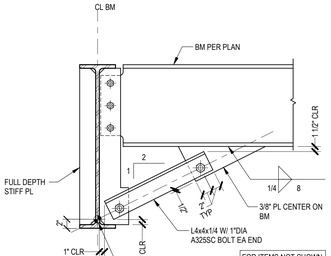
NTS 051200_02-0109



A 6" MAX DEPTH DIFFERENCE



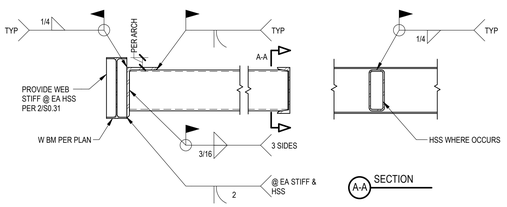
B 6" TO 12" DEPTH DIFFERENCE



C GREATER THAN 12" DEPTH DIFFERENCE

19 W COL TO HSS BM MOMENT CONNECTION

1" = 1'-0"

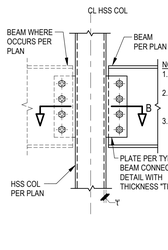


A-A SECTION

15 GRAVITY COLUMN BASEPLATE

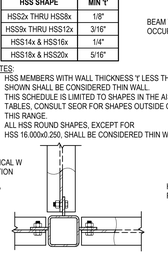
NTS 051200_01-0101

THICK WALL SCHEDULE	
HSS SHAPE	MIN 't'
HSS2x THRU HSS8x	1/8"
HSS9x THRU HSS12x	3/16"
HSS14x & HSS16x	1/4"
HSS18x & HSS20x	5/16"



NOTES:
1. HSS MEMBERS WITH WALL THICKNESS 't' LESS THAN SHOWN SHALL BE CONSIDERED THIN WALL.
2. THIS SCHEDULE IS LIMITED TO SHAPES IN THE AISC TABLES. CONSULT SEOR FOR SHAPES OUTSIDE OF THIS RANGE.
3. ALL HSS ROUND SHAPES, EXCEPT FOR HSS 16.000x0.250, SHALL BE CONSIDERED THIN WALL.

A THICK WALL HSS



B SECTION

C THIN WALL HSS @ ROOF

CONFIGURATIONS: □– OR –□–

D THIN WALL HSS @ FLOOR

NOTES:
1. DETAIL "A" SHALL ONLY BE USED FOR THE SHAPES INDICATED IN THE "THICK WALL SCHEDULE".
2. FOR COLLECTOR CONNECTIONS (INDICATED BY "LFRS" OR ——●—— ON PLAN), USE DETAILS "C" OR "D".

7 BOTTOM FLANGE BRACE

NTS 051200_02-0108

A BEAM TO COLUMN FLANGE

B BEAM TO COLUMN WEB

C BEAM TO GIRDER

SEE TYPICAL W BEAM CONNECTION DETAIL FOR INFO NOT SHOWN OR NOTED

8 BEAM CONNECTION WITH SLIP CRITICAL BOLTS

NTS 051200_06-0100

20 DETAIL

1" = 1'-0"

16 BEAM TO HSS COLUMN CONNECTION

NTS 051200_01-0102

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M022060001.00 - v20

T: (909) 270-8648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — TRAVIS J. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

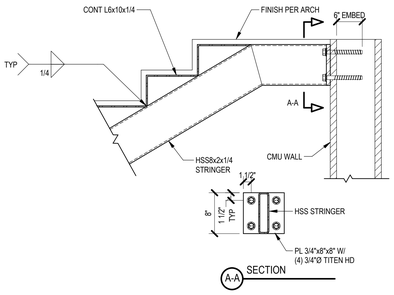
TYPICAL STRUCTURAL STEEL DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

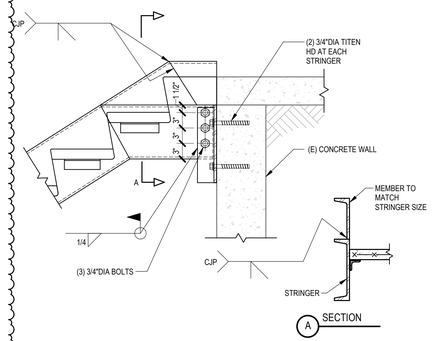
S0.32

11/6/2024 4:39:44 PM



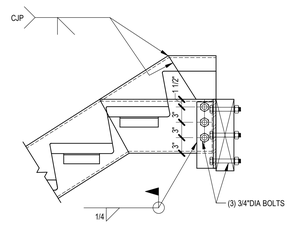
5 STEEL STAIR DETAIL

1" = 1'-0"



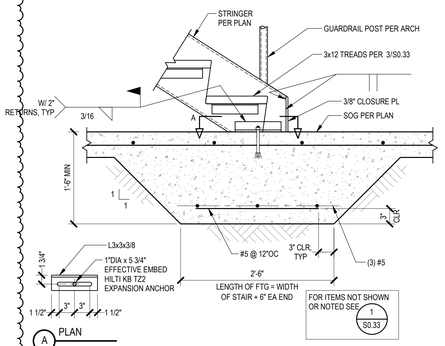
1 STRINGER AT (E) CONCRETE WALL

NTS 055100-0041



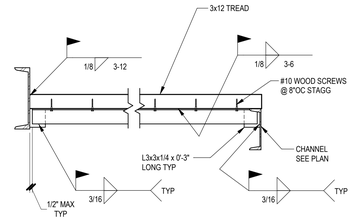
6 STRINGER AT WOOD BEAM

NTS



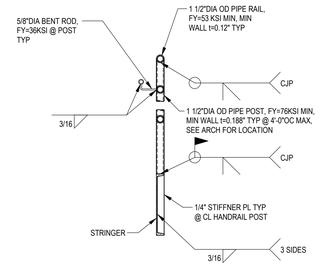
2 STAIR STRINGER FOOTING

NTS 055100-0021



3 STAIR TREAD

1" = 1'-0"



4 TYPICAL HANDRAIL DETAIL

1" = 1'-0"

11/6/2024 4:38:45 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA 91762
M0220600.00 - v20
T: (800) 270-8848
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
FRANK J. PETCOFF
C 69888
CIVIL
STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

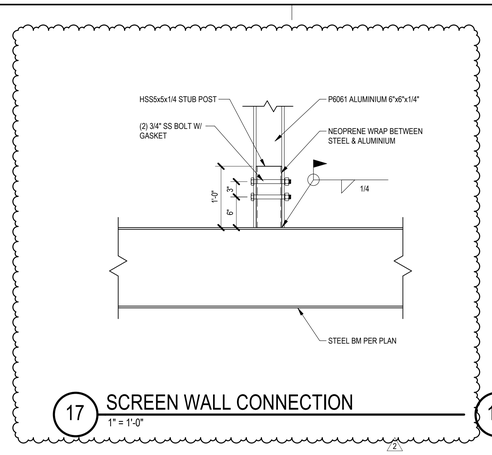
SHEET TITLE:

TYPICAL STEEL STAIR DETAILS

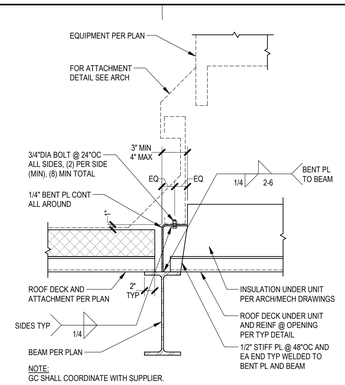
SCALE: 1" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

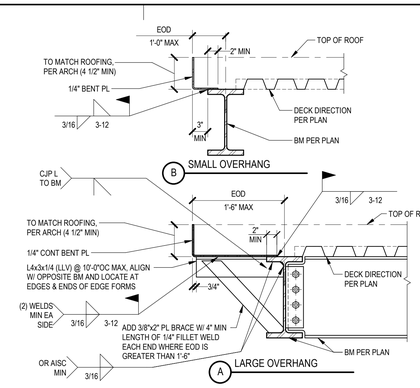
S0.33



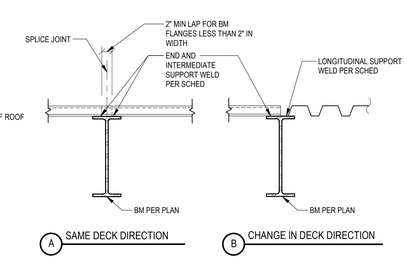
17 SCREEN WALL CONNECTION
1" = 1'-0"



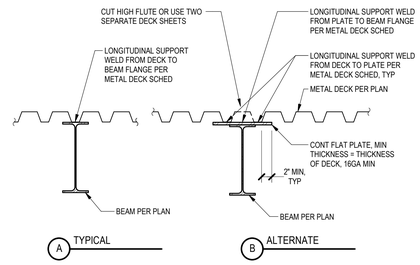
13 ROOF EQUIPMENT FRAMING
1" = 1'-0"



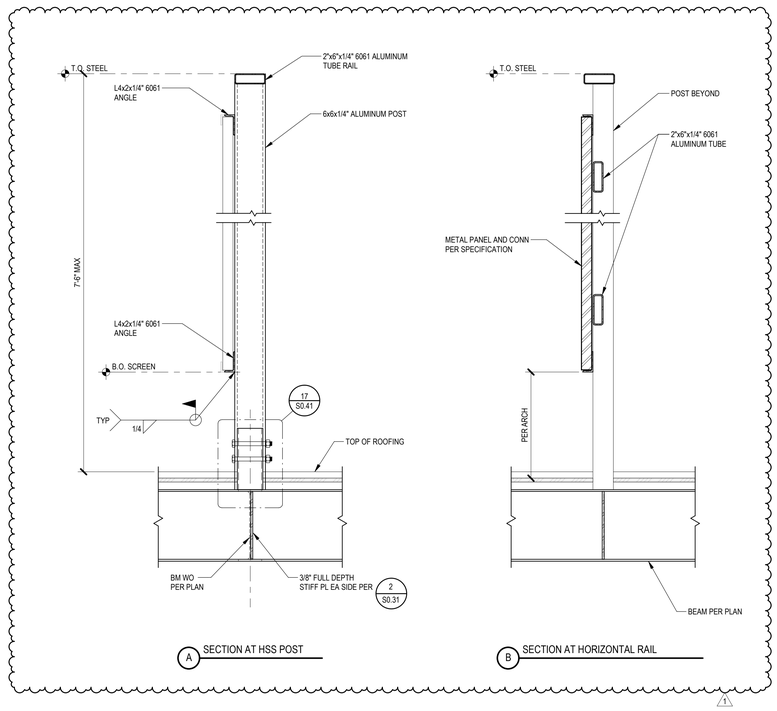
9 EDGE OF UNFILLED METAL DECK
NTS 053123-0102



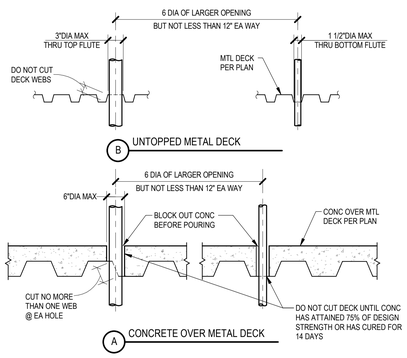
5 METAL DECK SPLICE
NTS 053000-0100



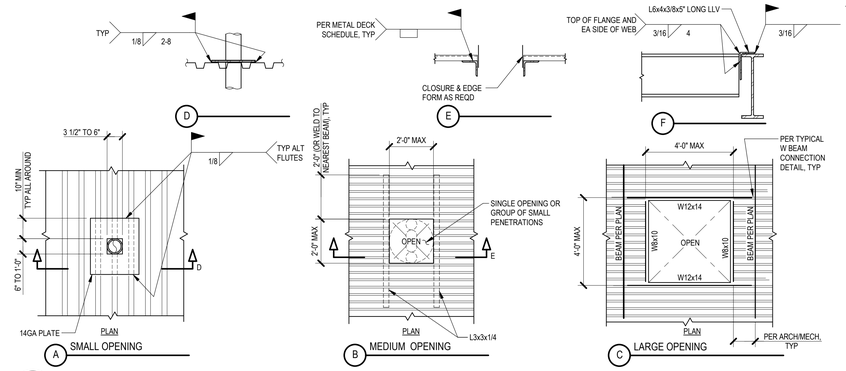
1 DECK PARALLEL TO BEAM
NTS 053123-0101



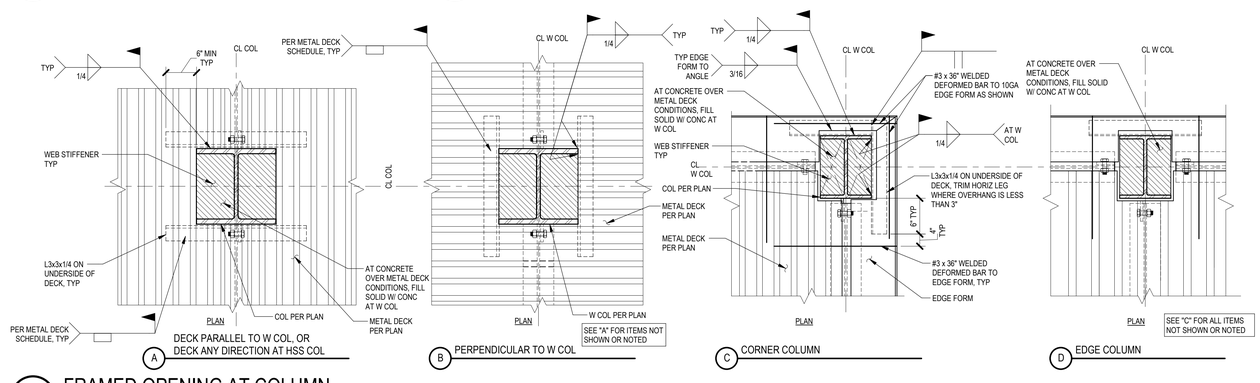
19 ROOF EQUIPMENT SCREEN
1" = 1'-0"



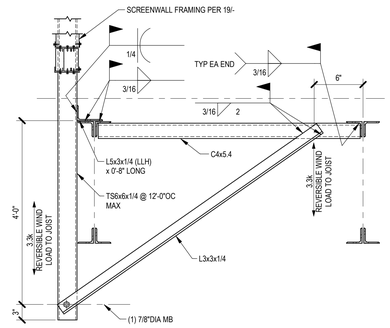
10 PENETRATIONS IN METAL DECK
NTS 053000-0101



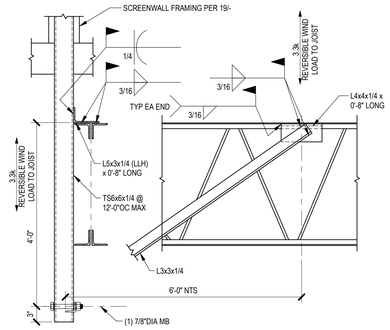
6 OPENINGS IN METAL DECK
NTS 053123-0100



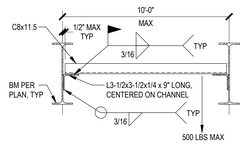
11 FRAMED OPENING AT COLUMN
NTS 053113-0105



20 SCREENWALL PARALLEL TO JOISTS
NTS

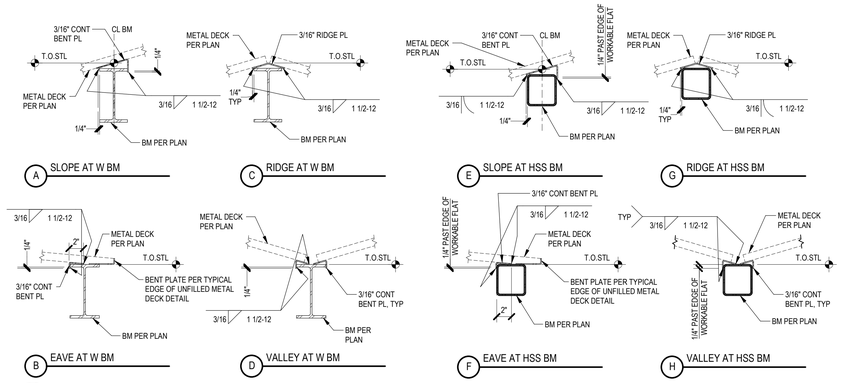


16 SCREENWALL PERPENDICULAR TO JOISTS
NTS



NOTES:
1. MULTIPLE CHANNELS WITH A SUPPORTED LOAD EXCEEDING 50 LBS SHALL BE SPACED AT 1'-0" MIN. TOTAL LOAD PER BEAM SHALL NOT EXCEED 1000 LBS.
2. LOAD TO HANG FROM STEEL DECK WITHOUT CHANNEL SUPPORT SHALL NOT EXCEED 150 LBS PER SHEET OF DECK PER SPAN. MINIMUM SPACING BETWEEN ANCHORS SUPPORTING GREATER THAN 20 POUNDS SHALL BE 1'-0" MIN.
3. LAYOUTS AND CONNECTIONS TO DECK IN ACCORDANCE WITH OSHPD OPM OR SMACNA DESIGNED BY OTHERS IS ACCEPTABLE IN LIEU OF THE DETAILS ABOVE.

12 HANGER SUPPORT AT BEAMS
NTS 053123-0105



8 SLOPED DECK TO BEAM
NTS 053123-0103

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA, 91762
T: (909) 270-8648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — C 69880 — CIVIL — STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

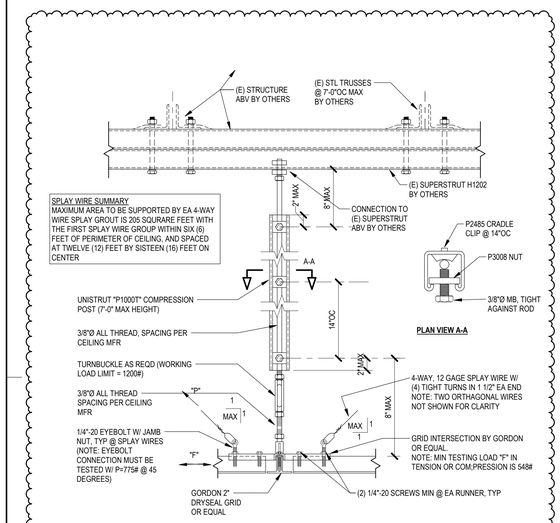
TYPICAL METAL DECK DETAILS

SCALE: 1" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

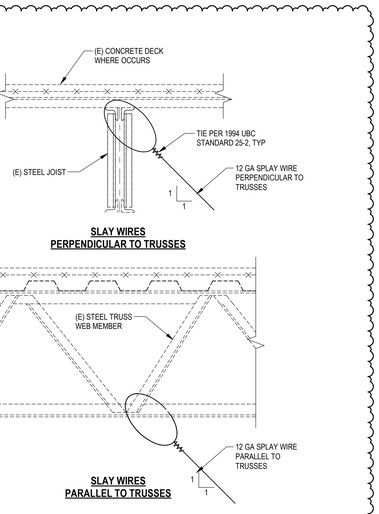
S0.41

11/6/2024 4:38:50 PM



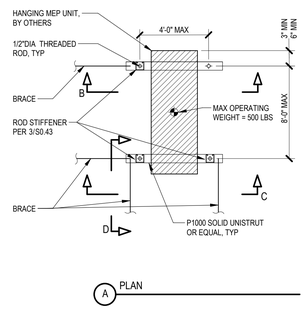
18 CONNECTION AT CEILING GRID ASSEMBLY

NTS

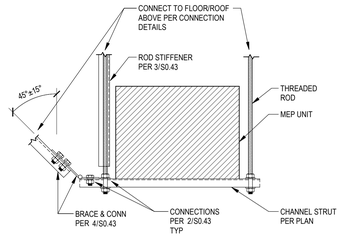


19 TYPICAL WIRE CONN TO STEEL JOIST

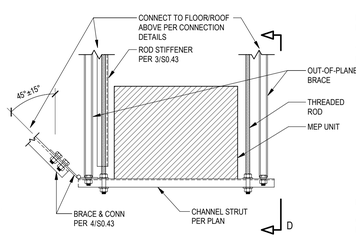
NTS



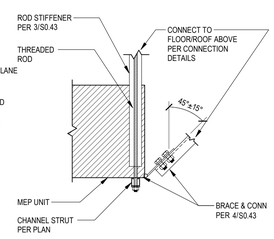
A PLAN



B SECTION



C SECTION

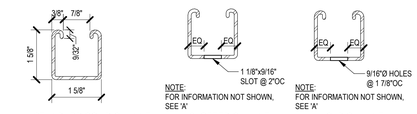


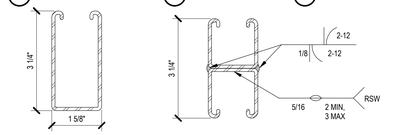
D SECTION

NOTES:
1. THIS DETAIL MAY BE USED FOR SIMILAR HANGING EQUIPMENT.
2. SEE MEP PLANS FOR ALL HANGING EQUIPMENT LOCATIONS.
3. PROVIDE POSITIVE ATTACHMENT FROM UNIT TO STRUT PER MANUFACTURER'S RECOMMENDATION.

13 HANGING MEP UNIT SUPPORT

NTS 054300-0201

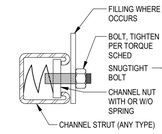




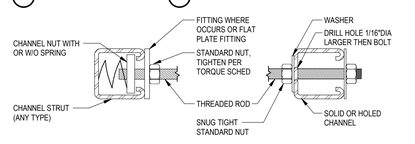
NOTE:
1. THICKNESS SHALL BE 12GA (0.105").
2. USE SLOTTED CHANNEL OR CHANNEL W/ HOLES ONLY WHERE INDICATED.
3. SLOTS AND HOLES ARE APPLICABLE FOR ALL CHANNEL TYPES.

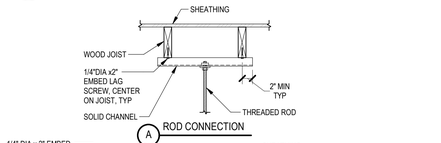
1 STANDARD CHANNEL STRUT SECTIONS

NTS 054300-0001

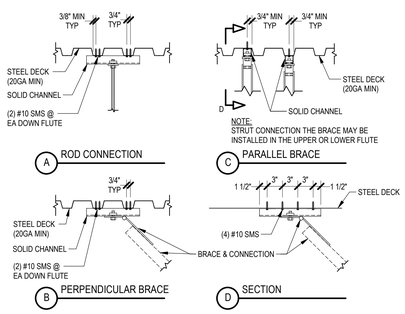


TORQUE SCHEDULE	
BOLT DIAMETER	APPLIED TORQUE
5/16"	11 FT-LBS
3/8"	19 FT-LBS
1/2"	50 FT-LBS
5/8"	100 FT-LBS
3/4"	125 FT-LBS

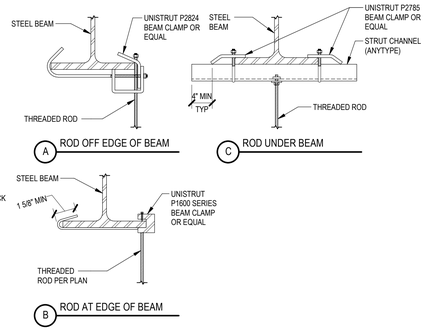




NOTE:
MAXIMUM LOAD = 250 LBS



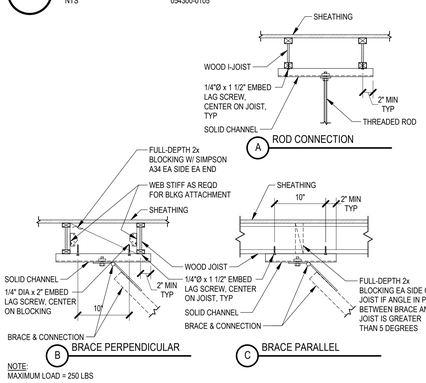
NOTE:
LOAD HANGING FROM STEEL DECK SHALL NOT EXCEED 150 LBS PER SHEET OF DECK PER SPAN. MIN SPACING BETWEEN ANCHORS SUPPORTING GREATER THAN 20 POUNDS SHALL BE 1-0".



NOTES:
1. ALSO APPLIES TO OPEN-WEB STEEL JOISTS
2. MAXIMUM LOAD = 250 LBS

14 CONNECTION TO WOOD STUD JOISTS

NTS 054300-0105



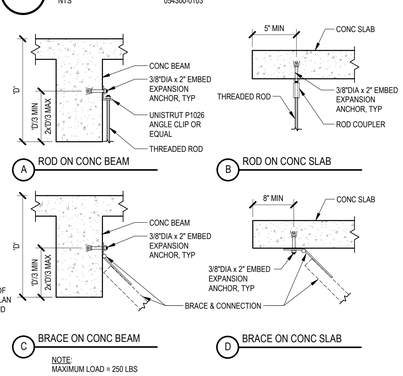
NOTE:
MAXIMUM LOAD = 250 LBS

15 CONNECTION TO WOOD I-JOISTS

NTS 054300-0106

10 CONNECTION TO METAL DECK

NTS 054300-0103



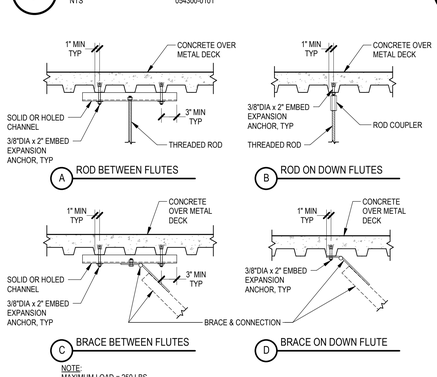
NOTE:
MAXIMUM LOAD = 250 LBS

11 CONNECTION TO CONCRETE

NTS 054300-0104

6 CONNECTION TO STEEL BEAM

NTS 054300-0101



NOTE:
MAXIMUM LOAD = 250 LBS

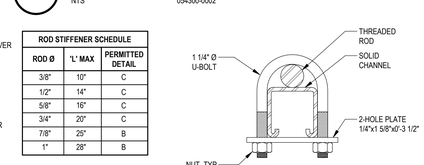
7 CONN TO CONCRETE OVER METAL DECK

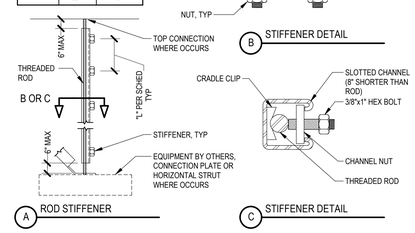
NTS 054300-0102

2 BOLT / THREADED ROD CONNECTIONS

NTS 054300-0002

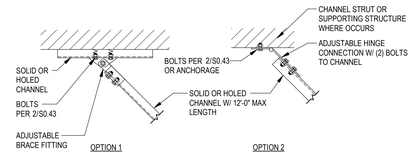
ROD STIFFENER SCHEDULE		
ROD Ø	'L' MAX	PERMITTED DETAIL
3/8"	10"	C
1/2"	14"	C
5/8"	16"	C
3/4"	20"	C
7/8"	25"	B
1"	28"	B





3 ROD STIFFENER

NTS 054300-0003



4 BRACING CONNECTION

NTS 054300-0004

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA, 91762
M022060/1-00 - v20
T: (800) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — RACHEL L. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

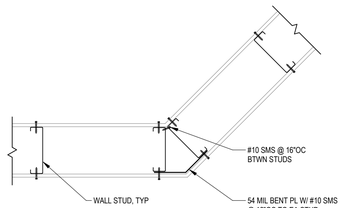
TYPICAL CHANNEL STRUT DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

S0.43

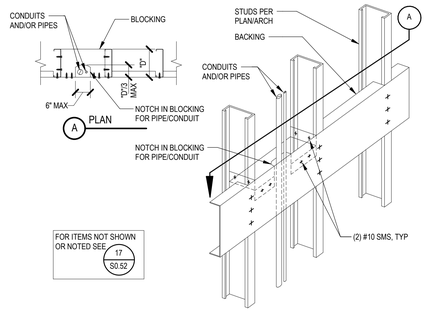
11/6/2024 4:38:54 PM



PLAN

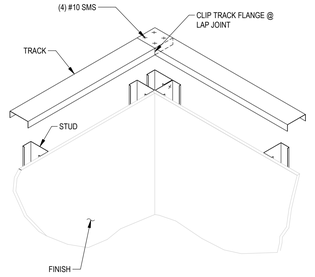
13 ANGLED WALL

NTS 054000-02-0106



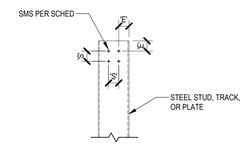
9 NOTCHED BACKING REINFORCEMENT

NTS 054000-02-0103



5 WALL FRAMING AT CORNER

NTS 054000-01-0106

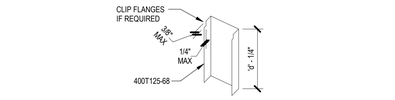


SHEET METAL SCREW SCHEDULE			
SCREW DESIGNATION	SCREW DIAMETER	MIN EDGE DISTANCE 'E'	MIN SPACING 'S'
#8	0.164"	1/4"	1/2"
#10	0.190"	3/8"	5/8"
#12	0.216"	3/8"	3/4"
#14 OR 1/4"	0.250"	1/2"	1"

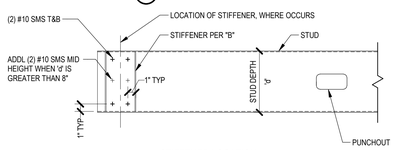
NOTE:
USE THE LARGER OF THE DIMENSIONS IN THIS TABLE AND THE DIMENSIONS IN THE SCREW'S THIRD PARTY EVALUATION REPORT.

1 SCREW EDGE DISTANCE & SPACING

NTS 054000-02-0100



B ISOMETRIC

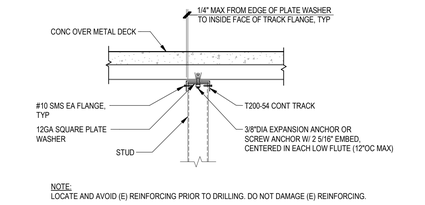


A STIFFENER LOCATION

NOTE:
STIFFENER MAY BE LOCATED ON THE BACK OF THE STUD OR WITHIN THE CHANNEL OF THE STUD.

14 WEB STIFFENER

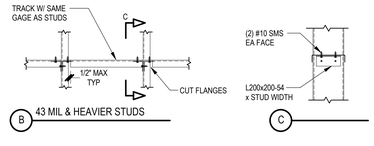
NTS 054000-02-0107



NOTE:
LOCATE AND AVOID (E) REINFORCING PRIOR TO DRILLING. DO NOT DAMAGE (E) REINFORCING.

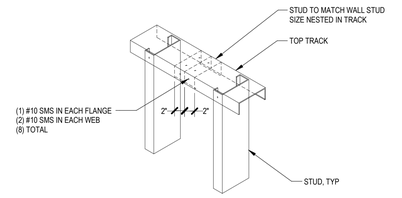
SUSPENDED SOFFIT WALL TO CONCRETE OVER METAL DECK - WALL PERPENDICULAR TO FLUTES

NTS 054000-02-0109



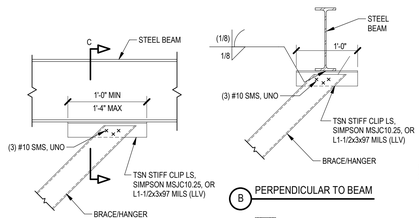
6 METAL STUD BLOCKING

NTS 054000-02-0101



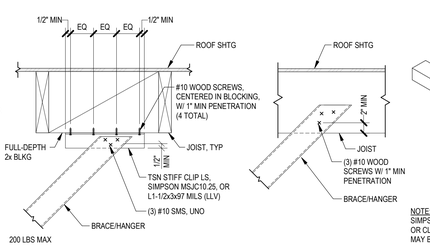
2 TOP TRACK SPLICE

NTS 054000-02-0102



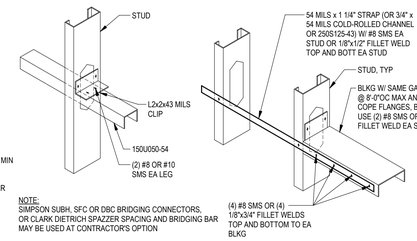
15 BRACE/HANGER TO STEEL BEAM

NTS 054000-02-113



11 BRACE/HANGER TO WOOD STUD JOISTS

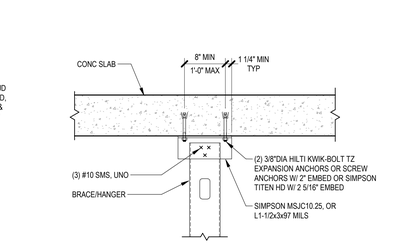
NTS 054000-02-0111



NOTE:
PROVIDE BRIDGING ON SIDE WITH NO FINISH MATERIAL
(BOTH SIDES IF NO FINISH EITHER SIDE) @ 48"OC MAX.

7 STEEL STUD FLANGE BRIDGING

NTS 054000-01-0108



NOTES:
1. SHOWN AS VERTICAL HANGER, BUT ALSO APPLIES TO DIAGONAL BRACES AND KICKERS.
2. LOCATE AND AVOID (E) REINFORCING PRIOR TO DRILLING. DO NOT DAMAGE (E) REINFORCING.

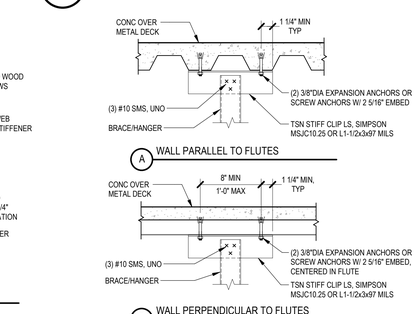
3 BRACE/HANGER TO CONCRETE SLAB

NTS 054000-02-0123

NOTE:
SHOWN AS DIAGONAL BRACE, BUT ALSO APPLIES TO VERTICAL HANGERS.

12 BRACE/HANGER TO WOOD I-JOISTS

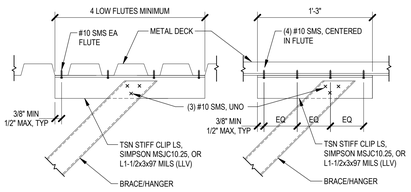
NTS 054000-02-0112



NOTES:
1. SHOWN AS VERTICAL HANGER, BUT ALSO APPLIES TO DIAGONAL BRACES AND KICKERS.
2. LOCATE AND AVOID (E) REINFORCING PRIOR TO DRILLING. DO NOT DAMAGE (E) REINFORCING.

BRACE/HANGER TO CONCRETE OVER METAL DECK

NTS 054000-02-0109



NOTE:
SHOWN AS DIAGONAL BRACE, BUT ALSO APPLIES TO VERTICAL HANGERS.

4 BRACE/HANGER TO METAL DECK

NTS 054000-02-0108

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MS2208001.00 - v20

T: (833) 270-6848
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER TRAVIS PETCOFF MIYAMOTO C 69880 CIVIL STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

TYPICAL COLD-FORMED STEEL DETAILS

SCALE: As indicated

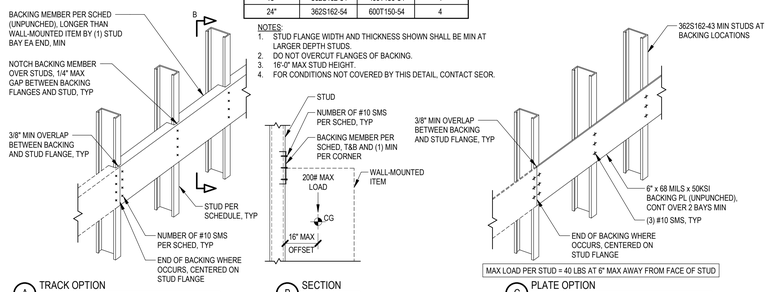
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S0.51

11/6/2024 4:38:56 PM

STUD SPACING	MIN STUD SIZE	BACKING MEMBER	NO OF SMS
12"	362S162-43	362T150-54	4
16"	362S162-54	400T150-54	4
24"	362S162-54	600T150-54	4

NOTES:
1. STUD FLANGE WIDTH AND THICKNESS SHALL BE MIN AT LARGER DEPTH STUDS.
2. DO NOT OVERCUT FLANGES OF BACKING.
3. 16'-0" MAX STUD HEIGHT.
4. FOR CONDITIONS NOT COVERED BY THIS DETAIL, CONTACT SEOR.

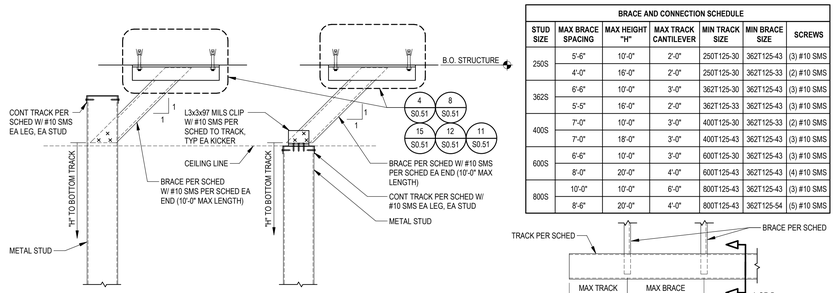


MAX LOAD PER STUD = 40 LBS AT 6" MAX AWAY FROM FACE OF STUD

A TRACK OPTION · B SECTION · C PLATE OPTION

17 WALL-HUNG ITEM BACKING

NTS 054000-01-0107



A FRAMED ABOVE CEILING · B FRAMED TO CEILING

BRACE AND CONNECTION SCHEDULE						
STUD SIZE	MAX BRACE SPACING	MAX HEIGHT "H"	MAX TRACK CANTILEVER	MIN TRACK SIZE	MIN BRACE SIZE	SCREWS
250S	5'-6"	10'-0"	2'-0"	250T125-30	362T125-43	(3) #10 SMS
	4'-0"	16'-0"	2'-0"	250T125-30	362T125-33	(2) #10 SMS
362S	6'-6"	10'-0"	3'-0"	362T125-30	362T125-43	(3) #10 SMS
	5'-5"	16'-0"	2'-0"	362T125-33	362T125-43	(3) #10 SMS
400S	7'-0"	10'-0"	3'-0"	400T125-30	362T125-33	(2) #10 SMS
	7'-0"	18'-0"	3'-0"	400T125-43	362T125-43	(3) #10 SMS
600S	6'-6"	10'-0"	3'-0"	600T125-30	362T125-43	(3) #10 SMS
	8'-0"	20'-0"	4'-0"	600T125-43	362T125-43	(4) #10 SMS
800S	10'-0"	10'-0"	6'-0"	800T125-43	362T125-43	(3) #10 SMS
	8'-6"	20'-0"	4'-0"	800T125-43	362T125-54	(5) #10 SMS

A FRAMED ABOVE CEILING · B FRAMED TO CEILING · C PLAN

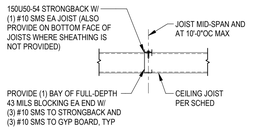
18 NON-BEARING WALL DIAGONAL KICKER

NTS 054000-01-0109

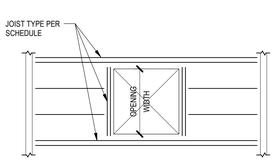
MAX CEILING JOIST SPAN SCHEDULE						
16" SPACING						
STUD THK	MEMBER SIZE					
	NO STRONGBACK			WITH STRONGBACK		
	362S137	400S137	600S137	362S137	400S137	600S137
43 MILS	11'-7"	12'-0"	13'-5"	16'-7"	17'-0"	19'-3"
33 MILS	10'-7"	10'-11"	12'-5"	15'-2"	15'-7"	17'-10"
30 MILS	10'-3"	10'-7"	12'-0"	14'-8"	15'-1"	17'-3"
27 MILS	9'-11"	10'-3"	11'-9"	14'-3"	14'-8"	16'-9"
24" SPACING						
STUD THK	MEMBER SIZE					
	NO STRONGBACK			WITH STRONGBACK		
	362S137	400S137	600S137	362S137	400S137	600S137
43 MILS	10'-4"	10'-9"	12'-0"	14'-9"	15'-2"	17'-4"
33 MILS	9'-6"	9'-10"	11'-2"	13'-6"	13'-11"	16'-0"
30 MILS	9'-2"	9'-6"	10'-10"	13'-0"	13'-5"	15'-6"
27 MILS	8'-11"	9'-2"	10'-6"	12'-6"	13'-0"	15'-0"

NOTE:
THIS SCHEDULE IS APPLICABLE FOR (1) LAYER OF GYPBOARD PER ARCH (6 PSF MAX) AND L/240 MAX DEFLECTION CRITERIA.

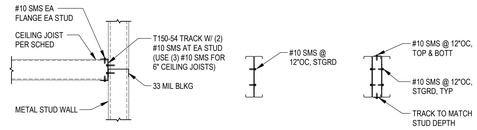
A AT CONCRETE/CMU WALL



C STRONGBACK



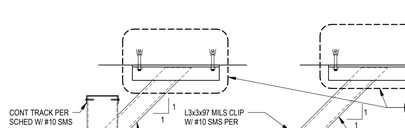
OPENING SUPPORT SCHEDULE		
OPENING WIDTH	JOIST TYPE	CONNECTION TYPE
16" MAX	SINGLE JOIST	(1) SIMPSON L50
32" MAX	DOUBLE JOIST	(1) SIMPSON L50
48" MAX	TRIPLE JOIST	(2) SIMPSON L50



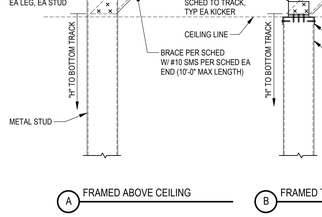
B AT STUD WALL · D DOUBLE JOIST · E TRIPLE JOIST · F TYPICAL OPENING FRAMING PLAN

19 INTERIOR CEILING JOIST SCHEDULE & DETAILS

NTS 054000-02-0118

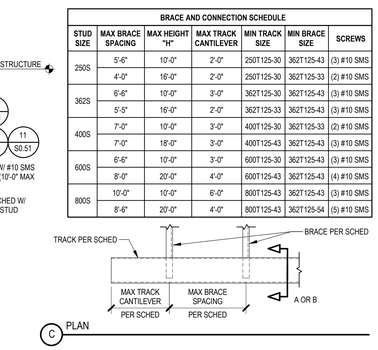


A · B



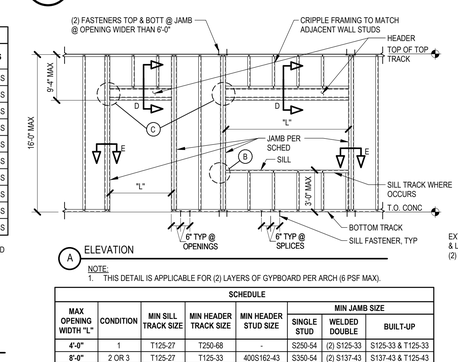
20 PARTIAL HEIGHT INT PARTITION - HSS

1" = 1'-0"

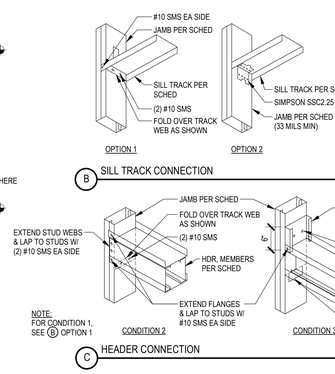


16 PARTIAL HEIGHT INT PARTITION - STUDS

1" = 1'-0"



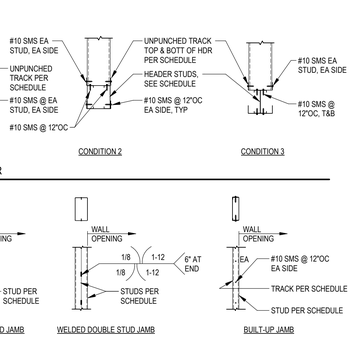
A HANGING SOFFIT



B SOFFIT TO WALL · C SINGLE VERT STUD SOFFIT

NOTES:
1. THIS DETAIL IS APPLICABLE FOR (1) LAYER OF GYPBOARD MAX ON EACH FACE OF WALL.
2. SOFFITS ARE NOT DESIGNED TO CARRY CABLE TRAYS, DUCT WORK, OR OTHER ITEMS.

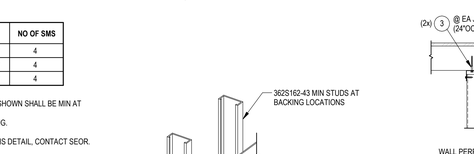
SOFFIT BRACE SCHEDULE	
BRACE	MAX SPAN
E: 362S137-33	10'-0"
E--: (2) 362S137-43 FASTENED TOGETHER W/ #10 SMS @ 12"OC	18'-6"



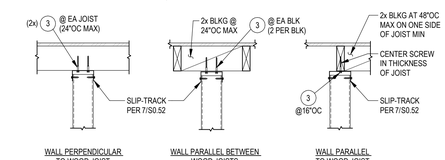
D DIAGONAL WALL SOFFIT BRACE

12 SOFFIT FRAMING

NTS 054000-02-0115

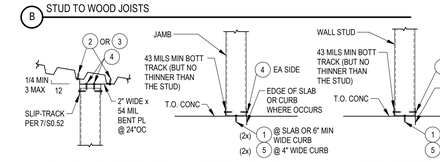


B STUD TO WOOD JOISTS

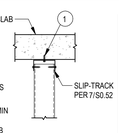


NOTE: COMPOSITE DECK SHOWN, BUT ALSO APPLICABLE TO BARE METAL DECK

F STUD TO METAL DECK



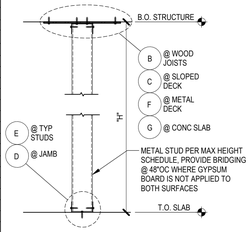
C CONDITION @ SLOPED DECK · D BOTTOM OF JAMB · E BOTTOM OF STUD



G STUD TO CONC SLAB

METAL STUD FASTENER SCHEDULE	
MARK	FASTENER SIZE & SPACING
1	PDF @ 16"OC W/ 1 1/4" MIN PENETRATION
2	PDF W/ 1 1/4" MIN PENETRATION @ DECK W/ CONC OR #10 SMS @ MTL DECK
3	#10 WOOD SCREW W/ 2" EMBED
4	#10 SHEET METAL SCREW (SMS)
5	3/8"DIA x 2" EMBED SCREW ANCHOR @ 16"OC

MAX HEIGHT "H" STUD SCHEDULE					
12" SPACING					
STUD THK	STUD SIZE				
	250S125	362S125	400S125	600S125	800S125
68 MILS	16'-4"	21'-11"	23'-9"	33'-0"	42'-0"
54 MILS	15'-4"	20'-6"	22'-2"	30'-9"	38'-9"
43 MILS	14'-4"	19'-2"	20'-8"	28'-9"	36'-1"
33 MILS	13'-2"	17'-7"	19'-0"	26'-2"	32'-8"
30 MILS	12'-9"	17'-0"	18'-5"	25'-2"	-
27 MILS	12'-4"	16'-5"	17'-9"	-	-
18 MILS	10'-6"	14'-1"	-	-	-
16" SPACING					
STUD THK	STUD SIZE				
	250S125	362S125	400S125	600S125	800S125
68 MILS	14'-10"	19'-11"	21'-7"	30'-0"	38'-2"
54 MILS	13'-11"	18'-7"	20'-1"	27'-11"	35'-2"
43 MILS	13'-0"	17'-7"	18'-10"	26'-1"	32'-9"
33 MILS	12'-0"	16'-0"	17'-3"	23'-9"	28'-8"
30 MILS	11'-7"	15'-5"	16'-8"	22'-11"	-
27 MILS	11'-3"	14'-11"	-	-	-
18 MILS	9'-7"	-	-	-	-
24" SPACING					
STUD THK	STUD SIZE				
	250S125	362S125	400S125	600S125	800S125
68 MILS	13'-0"	17'-5"	18'-10"	26'-2"	33'-4"
54 MILS	12'-2"	16'-3"	17'-7"	24'-6"	30'-9"
43 MILS	11'-5"	15'-2"	16'-5"	22'-10"	28'-8"
33 MILS	10'-6"	13'-11"	15'-1"	20'-6"	23'-5"
30 MILS	10'-2"	13'-6"	14'-7"	19'-0"	-
27 MILS	9'-10"	-	-	-	-
18 MILS	-	-	-	-	-



A STUD WALL SECTION

NOTES:
1. THIS SCHEDULE IS APPLICABLE FOR (2) LAYERS OF GYPBOARD PER ARCH (6 PSF MAX) AND L/240 MAX DEFLECTION CRITERIA.
2. STUDS SUPPORTING EQUIPMENT OR CASEWORK WEIGHING 40 LBS OR MORE SHALL BE 362S125 MIN & 54 MILS THICK MIN, UNO.

9 INTERIOR NON-BEARING STUD WALLS

NTS 054000-01-0101

A ELEVATION

NOTE:
1. THIS DETAIL IS APPLICABLE FOR (2) LAYERS OF GYPBOARD PER ARCH (6 PSF MAX).

SCHEDULE							
MAX OPENING WIDTH "L"	CONDITION	MIN SILL TRACK SIZE	MIN HEADER TRACK SIZE	MIN HEADER STUD SIZE	MIN JAMB STUD SIZE		
					SINGLE STUD	WELDED DOUBLE	BUILT-UP
4'-0"	1	T125-27	T250-68	-	S250-54	(2) S125-33	S125-33 & T125-33
8'-0"	2 OR 3	T125-27	T125-33	400S162-43	S350-54	(2) S137-43	S137-43 & T125-43
12'-0"	2 OR 3	T125-43	T125-43	600S162-43	S350-97	(2) S137-54	S137-54 & T125-54

B SILL TRACK CONNECTION

NOTE:
FOR CONDITION 1, SEE B OPTION 1

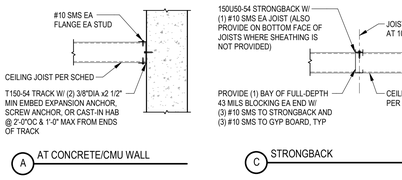
C HEADER CONNECTION

D HEADER

E JAMB

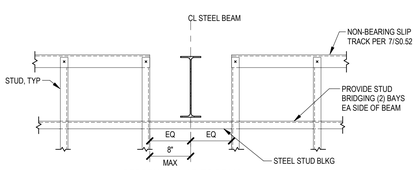
10 INTERIOR NON-BEARING WALL OPENING FRAMING

NTS 054000-01-0100



TRACK THICKNESS	MAX WALL HEIGHT "H"
33 MILS	15'-0"
43 MILS	24'-6"

NOTES:
1. GAP TO BE MEASURED AFTER CONCRETE IS CAST ON DECK, WHERE OCCURS.
2. SCREWS SHALL BE CENTERED VERTICALLY IN SLOTS.
3. PROVIDE GAP BETWEEN THE STRUCTURE ABOVE AND THE TOP OF GYPBOARD, WHERE OCCURS.



7 DEFLECTION TRACK ASSEMBLY

NTS 054000-01-0105

3 TOP OF WALL AT STEEL BEAM

NTS 054000-02-0116

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MI0209001-00 - v20
T: (909) 270-8848
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER · TRAVIS PETCOFF · C 69880 · CIVIL · STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/05/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

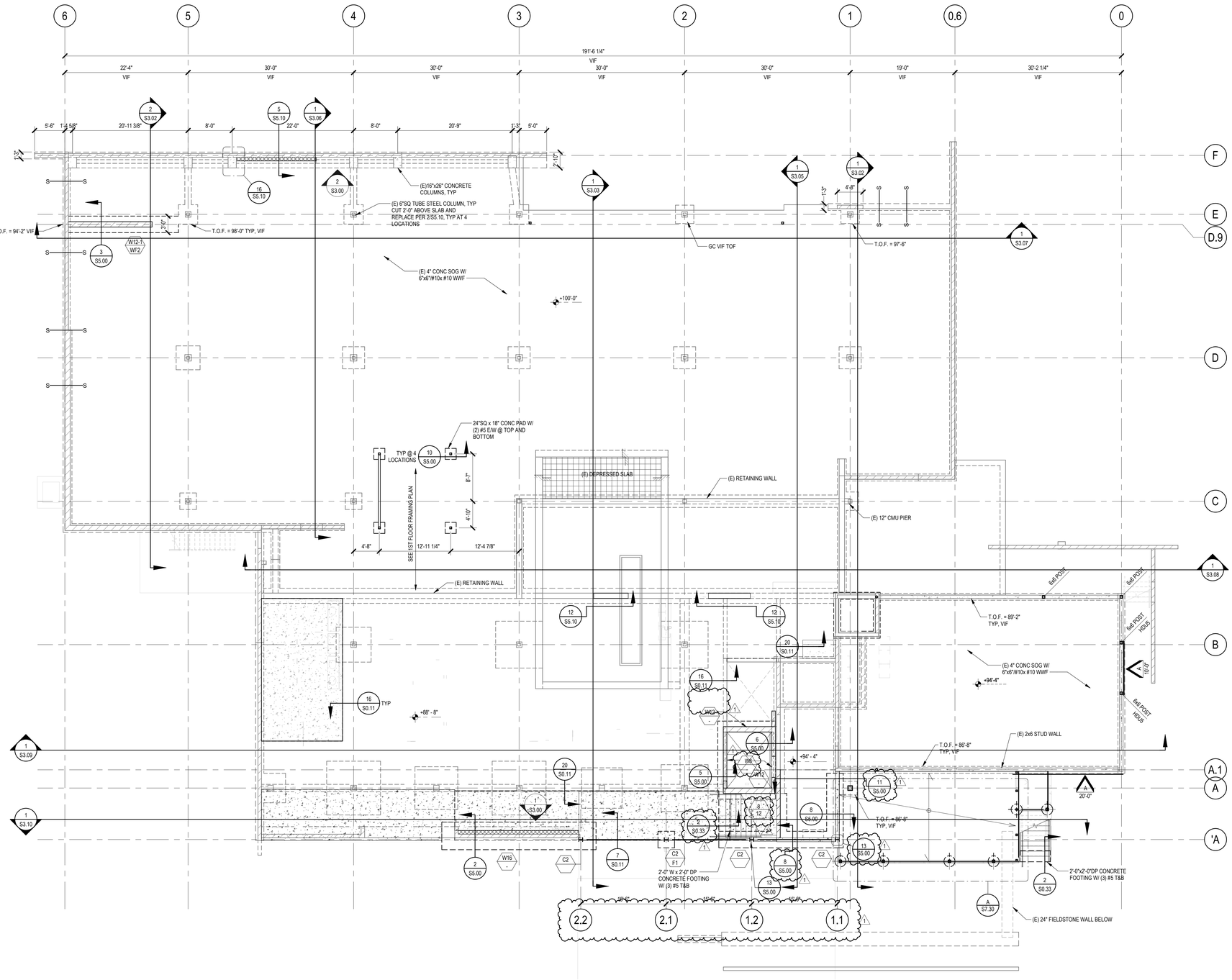
TYPICAL INTERIOR COLD-FORMED STEEL DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S0.52

11/6/2024 4:39:01 PM



FOUNDATION PLAN

1/8" = 1'-0"

north

NOTES:
1. ALL INTERIOR SLABS SHALL BE 4" THICK (UNO) W/ #3 @ 18"OC EA WAY @ MID-DEPTH OF SLAB,OVER 2" SAND, OVER 10 MIL (MIN) VAPOR BARRIER, OVER 4" CRUSHED ROCK FILL, OVER PREPARED BUILDING PAD.
2. SEE ARCHITECTURAL AND CIVIL FOR ALL EXTERIOR CONCRETE PAVING, SLAB, BASES, CURBS, SITE WALLS, ETC.
3. SEE PLANS AND ARCHITECTURAL DRAWINGS FOR DEPRESSIONS AND/OR SLOPES IN CONCRETE SLAB.
4. SEE TYPICAL PAD AND CURB DETAILS FOR CONCRETE PADS AND CURBS AND ABOVE SLAB UNLESS NOTED OTHERWISE. SEE ARCHITECTURAL, PLUMBING, MECHANICAL AND ELECTRICAL FOR LOCATION,SIZE AND HEIGHT OF PADS AND CURBS.
5. AT 4x AND 6x POSTS, PROVIDE A SIMPSON BCO AT THE BASE ON TOP OF SILL PLATE AND A SIMPSON PC/EPC AT THE TOP WHERE HEADER OCCURS (UNO).
6. ALL STRUCTURAL WALLS SHALL BE 2x6 @ 16"OC.
4. WHERE CONCRETE BEAMS OVERLAP/INTERSECT, THE TOP AND BOTTOM REINFORCEMENT OF THE WIDER BEAM SHALL BE PLACED IN THE OUTER LAYER.

LEGEND:

- C# / F# — INDICATES COLUMN/POST/WALL TYPE PER SCHEDULE ON S4.00; INDICATES PAD FOOTING TYPE PER SCHEDULE ON S4.00
- INDICATES CHANGE IN ELEVATION
- INDICATES SLOPED AND/OR DEPRESSED SLAB
- TOF -X'-X" — INDICATES TOP OF FOOTING (TOF) ELEVATION
- S — S — INDICATES STEP IN FOUNDATION PER TYPICAL STEPPED FOOTING DETAIL CONTRACTOR TO VERIFY LOCATION & EXTENT OF STEPPED FOUNDATIONS
- GB-# — INDICATES GRADE BEAM TYPE PER SCHEDULE
- INDICATES 8" SHORTCRETE WALL
- INDICATES CMU WALL
- INDICATES CONC WALL
- INDICATES WOOD STUD WALL
- INDICATES WALL BELOW
- INDICATES CONCRETE CURB, EXTENT PER ARCH
- ?x? — INDICATES WOOD POST
- ? — INDICATES HOLDOWN TYPE PER SCHEDULE
- X'-X" — INDICATES SHEARWALL TYPE PER SCHEDULE; INDICATES MINIMUM LENGTH REQD (SEE ARCH DRAWINGS FOR DIMENSIONS)
- INDICATES MOMENT CONNECTION PER PLAN
- INDICATES MOMENT FRAME CONNECTION PER PLAN
- +?'-?" — INDICATES TOP OF STEEL ELEVATION
- DR — INDICATES SPAN DIRECTION AND TYPE OF FILLED METAL DECK PER SCHEDULE ON S4.00
- DR — INDICATES SPAN DIRECTION AND TYPE OF UNFILLED METAL DECK PER SCHEDULE ON S4.00
- # — INDICATES ROOF DIAPHRAGM NAILING TYPE PER SCHEDULE
- # — INDICATES STRAP TYPE PER SCHEDULE
- AHU — INDICATES MECHANICAL UNIT WITH MAX OPERATING WEIGHT PER PLAN
- # — INDICATES STRAP PER SCHEDULES
- # — INDICATES WALL PER SCHEDULE S4.00
- INDICATES EXISTING MECH PAD PER MEP

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M22208001.00 - v20
T: (909) 270-9848
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — TRAVIS C. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

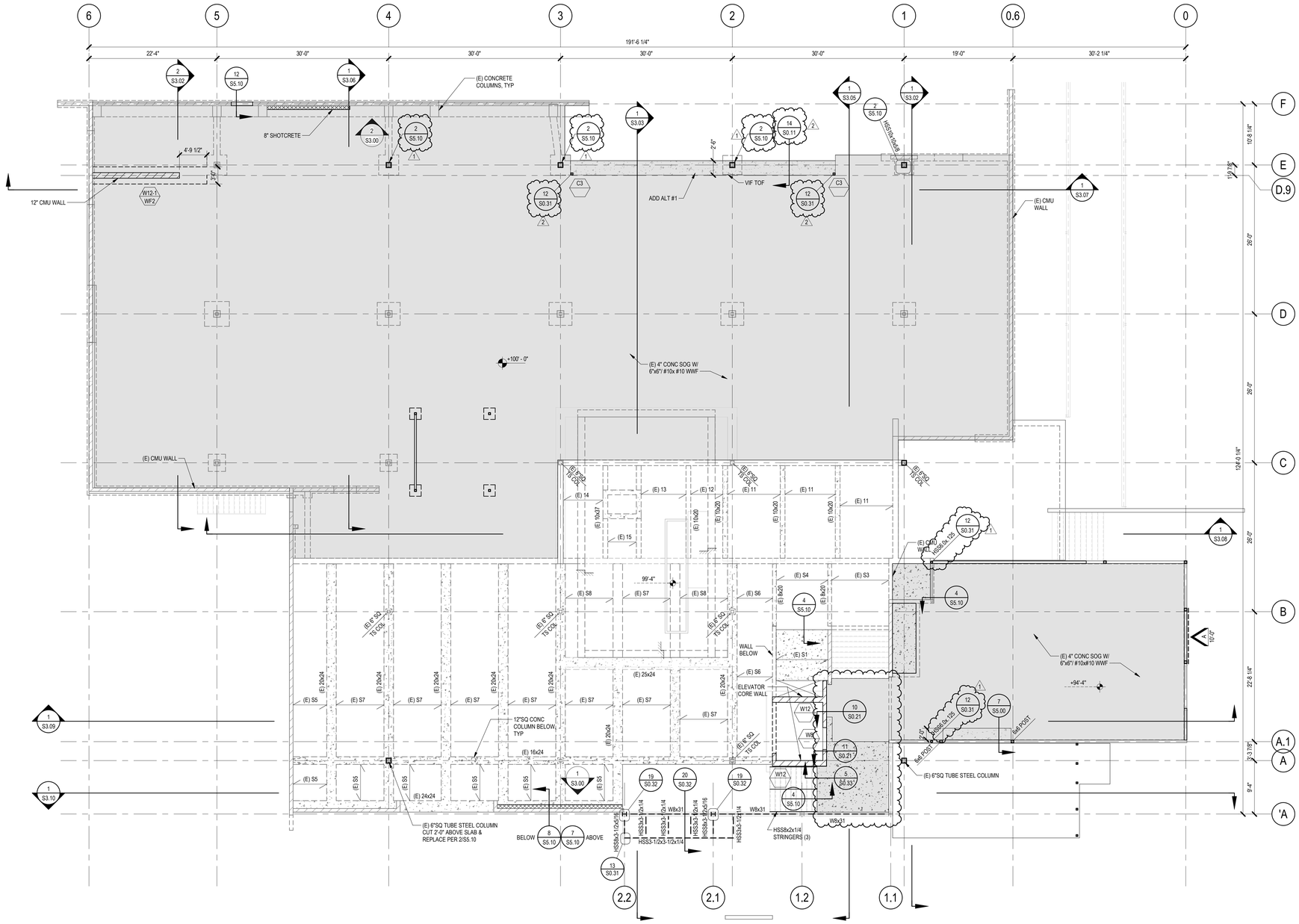
FOUNDATION PLAN

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S1.01

11/6/2024 4:39:04 PM



MAIN FLOOR FRAMING PLAN

NOTES:
1. FIRST FLOOR TOP OF THE SHEATING ELEVATION = +100'-0". SEE ARCHITECTURAL FOR FINISH FLOOR ELEVATION.
2. SEE ARCHITECTURAL, PLUMBING,MECHANICAL AND ELECTRICAL FOR LOCATION OF EQUIPMENT. CONTRACTOR TO VERIFY ALL UNIT LOCATIONS, SIZES AND OPENINGS.
3. ALL STRUCTURAL WALLS SHALL BE 2x6 @ 16"OC.
4. FIRST FLOOR WALLS BELOW SHOWN UNO.
5. ALL BEAMS SHALL BE EQUALLY SPACED BETWEEN COLUMNS/GIRDERS UNLESS NOTED OTHERWISE.
6. SEE ARCHITECTURAL FOR SLOPING AND ELEVATION OF SLABS, DEPRESSIONS, OPENINGS,RAMPS,ETC.

north

LEGEND:

- C# / F# — INDICATES COLUMN/POST/WALL TYPE PER SCHEDULE ON S4.00; INDICATES PAD FOOTING TYPE PER SCHEDULE ON S4.00
- INDICATES CHANGE IN ELEVATION
- INDICATES SLOPED AND/OR DEPRESSED SLAB
- TOF -X'-X" — INDICATES TOP OF FOOTING (TOF) ELEVATION
- S — S — INDICATES STEP IN FOUNDATION PER TYPICAL STEPPED FOOTING DETAIL CONTRACTOR TO VERIFY LOCATION & EXTENT OF STEPPED FOUNDATIONS
- GB-# — INDICATES GRADE BEAM TYPE PER SCHEDULE
- INDICATES 8" SHORTCRETE WALL
- INDICATES CMU WALL
- INDICATES CONC WALL
- INDICATES WOOD STUD WALL
- INDICATES WALL BELOW
- INDICATES CONCRETE CURB, EXTENT PER ARCH
- INDICATES WOOD POST
- ? — INDICATES HOLDOWN TYPE PER SCHEDULE
- X'-X" — INDICATES SHEARWALL TYPE PER SCHEDULE; INDICATES MINIMUM LENGTH REQD (SEE ARCH DRAWINGS FOR DIMENSIONS)
- INDICATES MOMENT CONNECTION PER PLAN
- INDICATES MOMENT FRAME CONNECTION PER PLAN
- +?'-?" — INDICATES TOP OF STEEL ELEVATION
- D# — INDICATES SPAN DIRECTION AND TYPE OF FILLED METAL DECK PER SCHEDULE ON S4.00
- D# — INDICATES SPAN DIRECTION AND TYPE OF UNFILLED METAL DECK PER SCHEDULE ON S4.00
- # — INDICATES ROOF DIAPHRAGM NAILING TYPE PER SCHEDULE
- # — INDICATES STRAP TYPE PER SCHEDULE
- AHU — INDICATES MECHANICAL UNIT WITH MAX OPERATING WEIGHT PER PLAN
- # — INDICATES STRAP PER SCHEDULES
- # — INDICATES WALL PER SCHEDULE S4.00
- INDICATES EXISTING MECH PAD PER MEP

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Orlando, CA 91780
MI22M001.00 - v00
T: (833) 272-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — RAHUL V. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

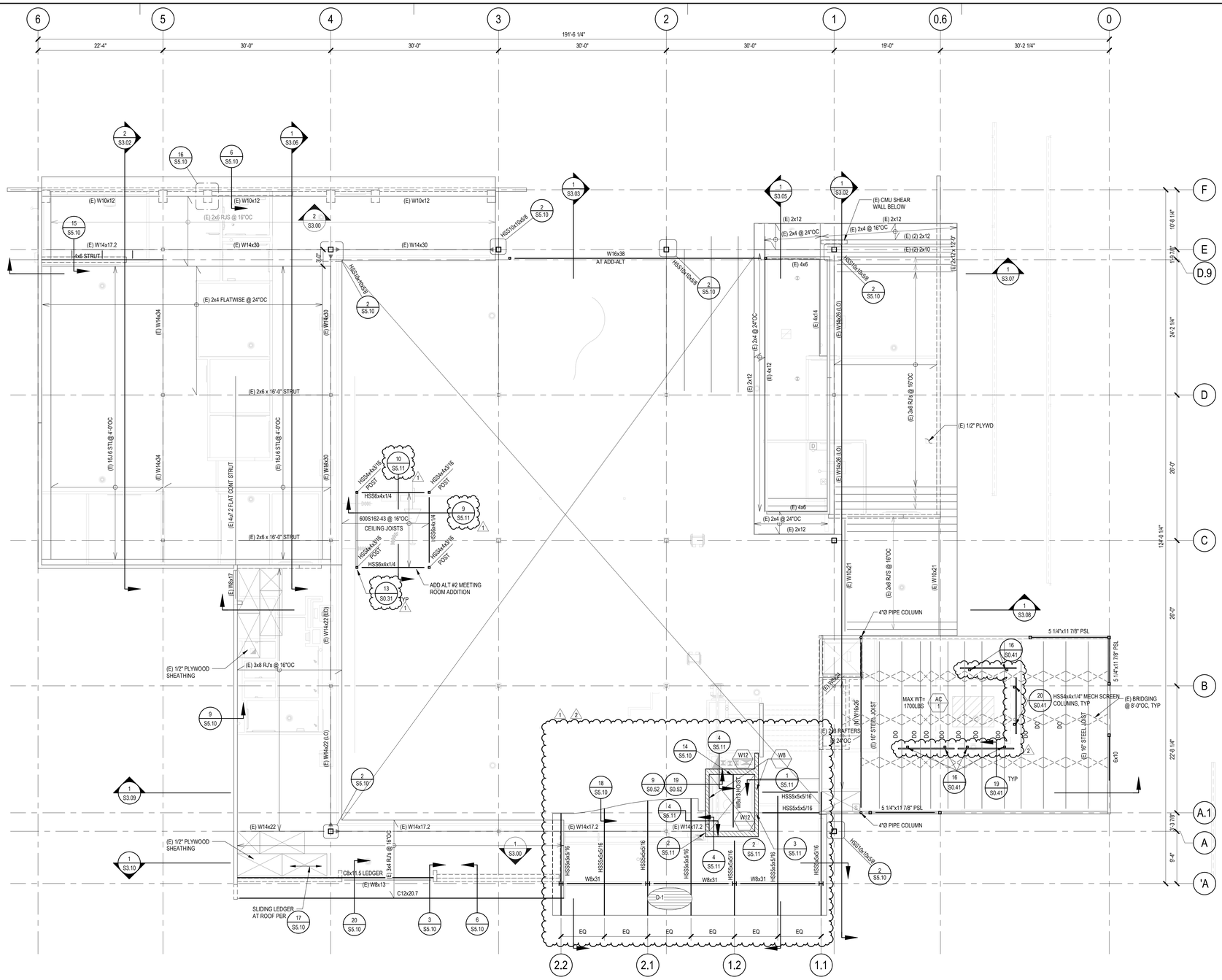
MAIN FLOOR FRAMING PLAN

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S1.02

11/6/2024 4:39:07 PM



LOW ROOF FRAMING PLAN

1/8" = 1'-0"

NOTES:
1. SEE ARCHITECTURAL FOR ROOF AND TOP OF PARAPET ELEVATIONS.
2. SEE ARCHITECTURAL, PLUMBING, MECHANICAL AND ELECTRICAL FOR LOCATION OF EQUIPMENT. CONTRACTOR TO VERIFY ALL UNIT LOCATIONS, SIZES AND OPENINGS.
3. ALL BEAMS SHALL BE EQUALLY SPACED BETWEEN COLUMNS/GIRDERS UNLESS NOTED OTHERWISE.
4. SEE ARCHITECTURAL FOR SLOPING AND ELEVATION OF SLABS, DEPRESSIONS, OPENINGS, RAMPS, ETC.
5. HEIGHT FROM TOP OF ROOF TO SOLAR ARRAY SYSTEMS SHALL BE LESS THAN 24". MAXIMUM WEIGHT OF SOLAR ARRAY SHALL BE 4 PSF.

north

LEGEND:

- C# / F# — INDICATES COLUMN/POST/WALL TYPE PER SCHEDULE ON S4.00; INDICATES PAD FOOTING TYPE PER SCHEDULE ON S4.00
- INDICATES CHANGE IN ELEVATION
- INDICATES SLOPED AND/OR DEPRESSED SLAB
- TOF -X'-X" — INDICATES TOP OF FOOTING (TOF) ELEVATION
- S — S — INDICATES STEP IN FOUNDATION PER TYPICAL STEPPED FOOTING DETAIL CONTRACTOR TO VERIFY LOCATION & EXTENT OF STEPPED FOUNDATIONS
- GB-# — INDICATES GRADE BEAM TYPE PER SCHEDULE
- INDICATES 8" SHORTCRETE WALL
- INDICATES CMU WALL
- INDICATES CONC WALL
- INDICATES WOOD STUD WALL
- INDICATES WALL BELOW
- INDICATES CONCRETE CURB, EXTENT PER ARCH
- ?x? — INDICATES WOOD POST
- ? — INDICATES HOLDOWN TYPE PER SCHEDULE
- X'-X" — INDICATES SHEARWALL TYPE PER SCHEDULE; INDICATES MINIMUM LENGTH REQD (SEE ARCH DRAWINGS FOR DIMENSIONS)
- INDICATES MOMENT CONNECTION PER PLAN
- INDICATES MOMENT FRAME CONNECTION PER PLAN
- +?'-?" — INDICATES TOP OF STEEL ELEVATION
- D# — INDICATES SPAN DIRECTION AND TYPE OF FILLED METAL DECK PER SCHEDULE ON S4.00
- D# — INDICATES SPAN DIRECTION AND TYPE OF UNFILLED METAL DECK PER SCHEDULE ON S4.00
- # — INDICATES ROOF DIAPHRAGM NAILING TYPE PER SCHEDULE
- # — INDICATES STRAP TYPE PER SCHEDULE
- AHU — INDICATES MECHANICAL UNIT WITH MAX OPERATING WEIGHT PER PLAN
- # — INDICATES STRAP PER SCHEDULES
- # — INDICATES WALL PER SCHEDULE S4.00
- INDICATES EXISTING MECH PAD PER MEP

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA 91762
T: (909) 270-9648
miyamotointernational.com
MI22080001.00 - xDD

LICENSED PROFESSIONAL ENGINEER — TIMOTHY J. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

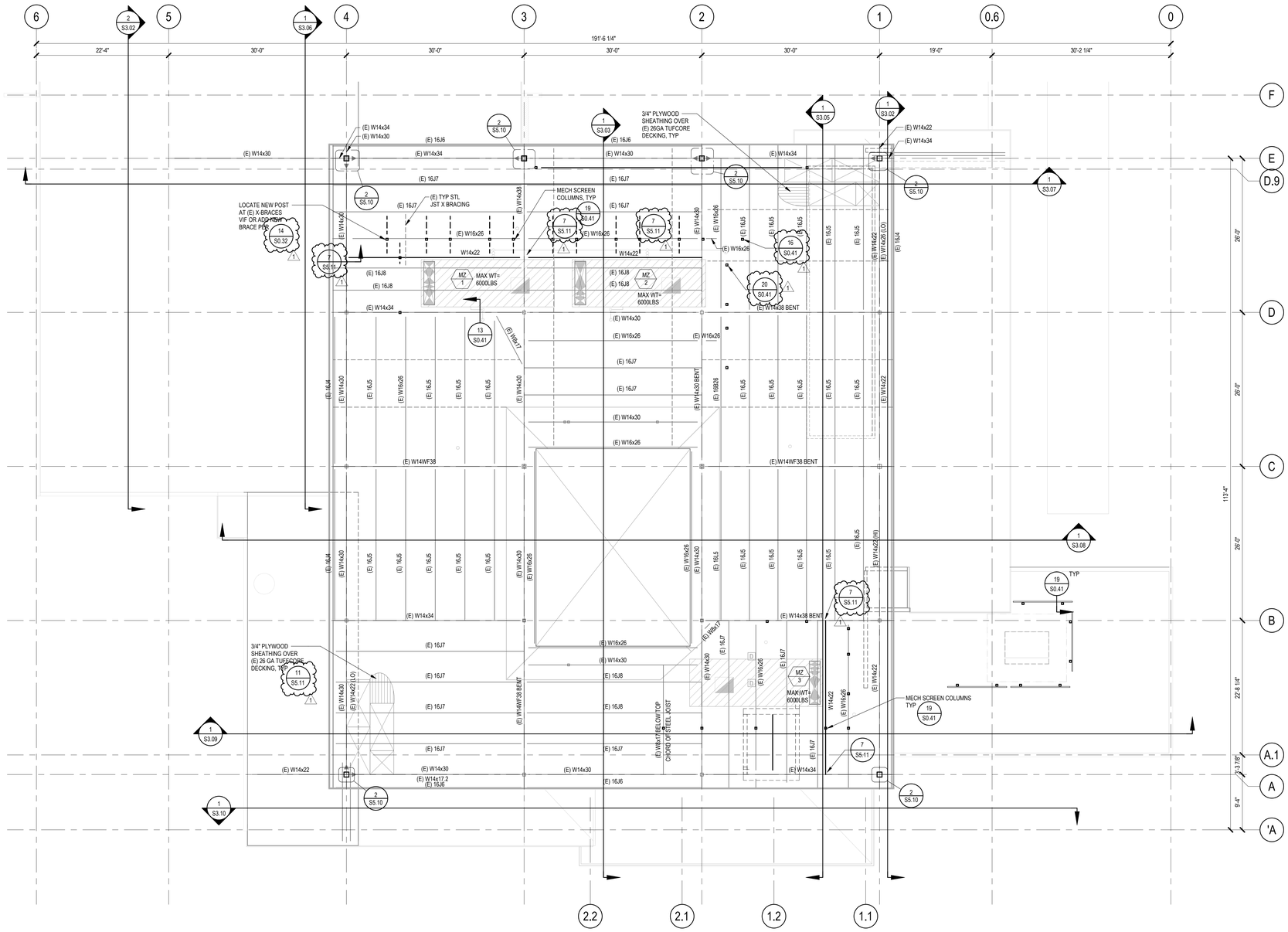
LOW ROOF FRAMING PLAN

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S1.03

11/6/2024 4:39:10 PM



HIGH ROOF FRAMING PLAN

1/8" = 1'-0"

north

LEGEND:

- C# / F# — INDICATES COLUMN/POST/WALL TYPE PER SCHEDULE ON S4.00; INDICATES PAD FOOTING TYPE PER SCHEDULE ON S4.00
- INDICATES CHANGE IN ELEVATION
- INDICATES SLOPED AND/OR DEPRESSED SLAB
- TOF -X'-X" — INDICATES TOP OF FOOTING (TOF) ELEVATION
- S — S — INDICATES STEP IN FOUNDATION PER TYPICAL STEPPED FOOTING DETAIL CONTRACTOR TO VERIFY LOCATION & EXTENT OF STEPPED FOUNDATIONS
- GB-# — INDICATES GRADE BEAM TYPE PER SCHEDULE
- INDICATES CMU WALL
- INDICATES CONC WALL
- INDICATES WOOD STUD WALL
- INDICATES WALL BELOW
- INDICATES CONCRETE CURB, EXTENT PER ARCH
- ?x? — INDICATES WOOD POST
- ? — INDICATES HOLDOWN TYPE PER SCHEDULE
- X'-X" — INDICATES SHEARWALL TYPE PER SCHEDULE; INDICATES MINIMUM LENGTH REQD (SEE ARCH DRAWINGS FOR DIMENSIONS)
- INDICATES MOMENT CONNECTION PER PLAN
- INDICATES MOMENT FRAME CONNECTION PER PLAN
- +?-?" — INDICATES TOP OF STEEL ELEVATION
- D# — INDICATES SPAN AND TYPE OF BARE METAL DECK PER SCHEDULE THIS SHEET
- # — INDICATES ROOF DIAPHRAGM NAILING TYPE PER SCHEDULE
- INDICATES EXISTING DECK OPENINGS
- AHU — INDICATES MECHANICAL UNIT WITH MAX OPERATING WEIGHT PER PLAN
- # — INDICATES STRAP PER SCHEDULE
- INDICATES EXISTING MECH PAD PER MEP

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Oxnard, CA 93030
MI22060/1.00 - v00

T: (805) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
RAHUL V. PETCOFF
C 69880
CIVIL
STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

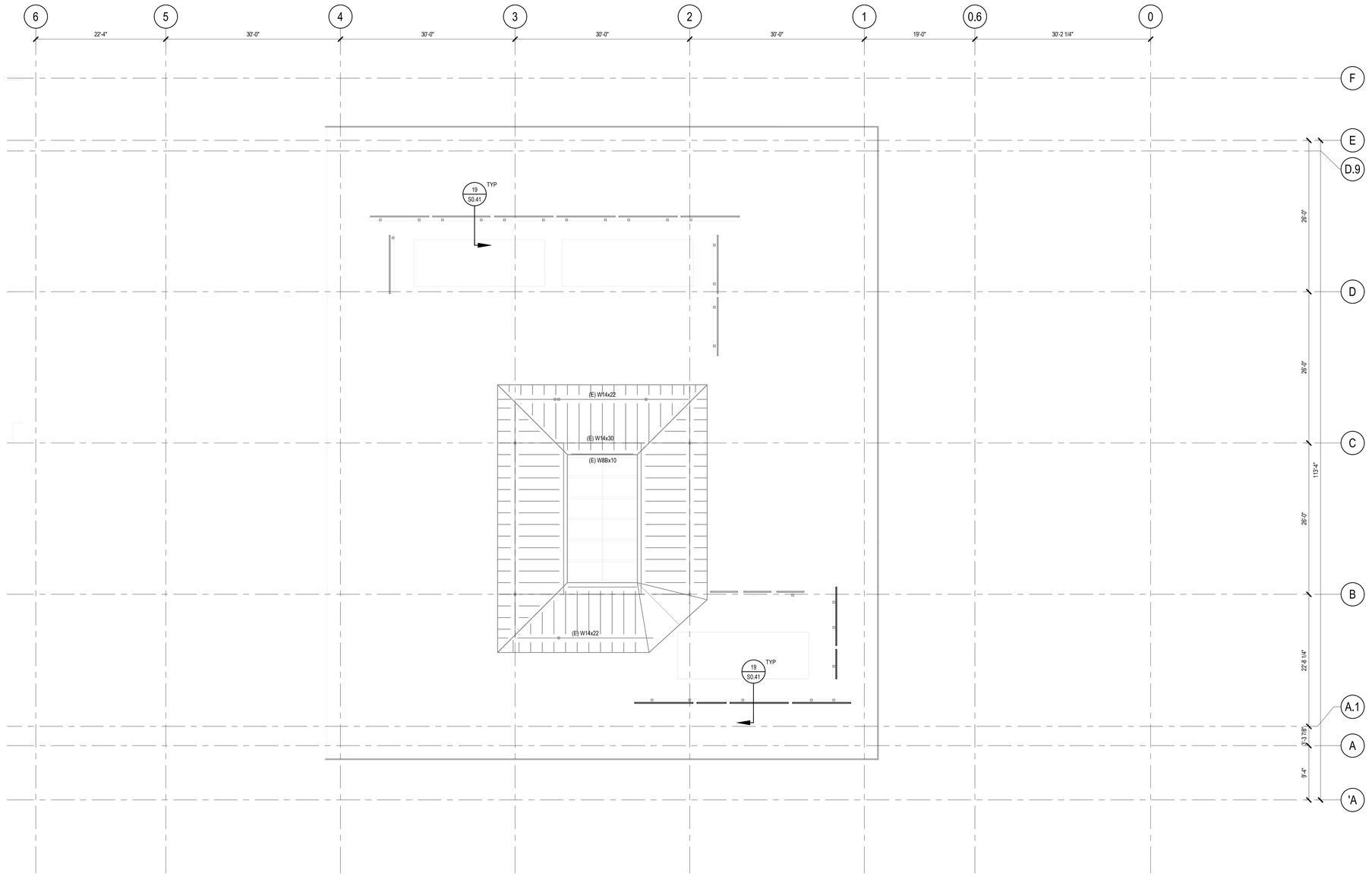
HIGH ROOF FRAMING PLAN

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S1.04

11/6/2024 4:39:12 PM



SKYLIGHT ROOF & A/C SCREEN FRAMING PLAN

1/8" = 1'-0"

north

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MI22P0031.00 - v20

T: (833) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
RAFIL I. PETCOFF
C 69880
CIVIL
STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

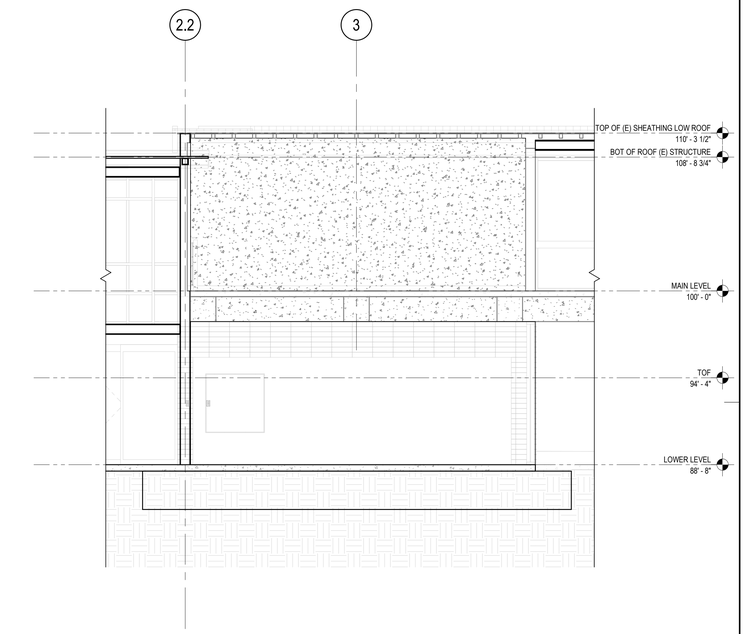
SKYLIGHT ROOF & A/C SCREEN FRAMING PLAN

SCALE: 1/8" = 1'-0"

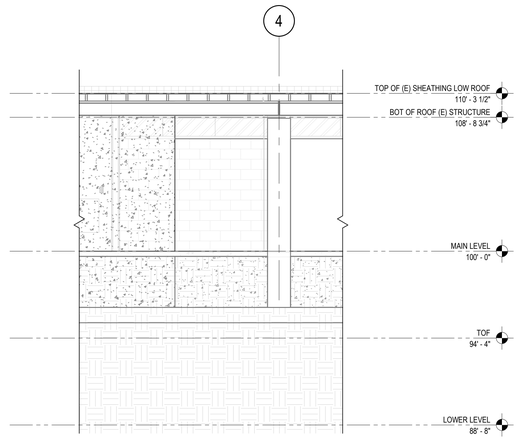
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S1.05

11/6/2024 4:39:13 PM



1 WALL ELEVATION
1/4" = 1'-0"



2 WALL ELEVATION
1/4" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MI02290001.00 - v20
T: (833) 272-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
RAHUL V. PETCOFF PATWA
C 69880
CIVIL
STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

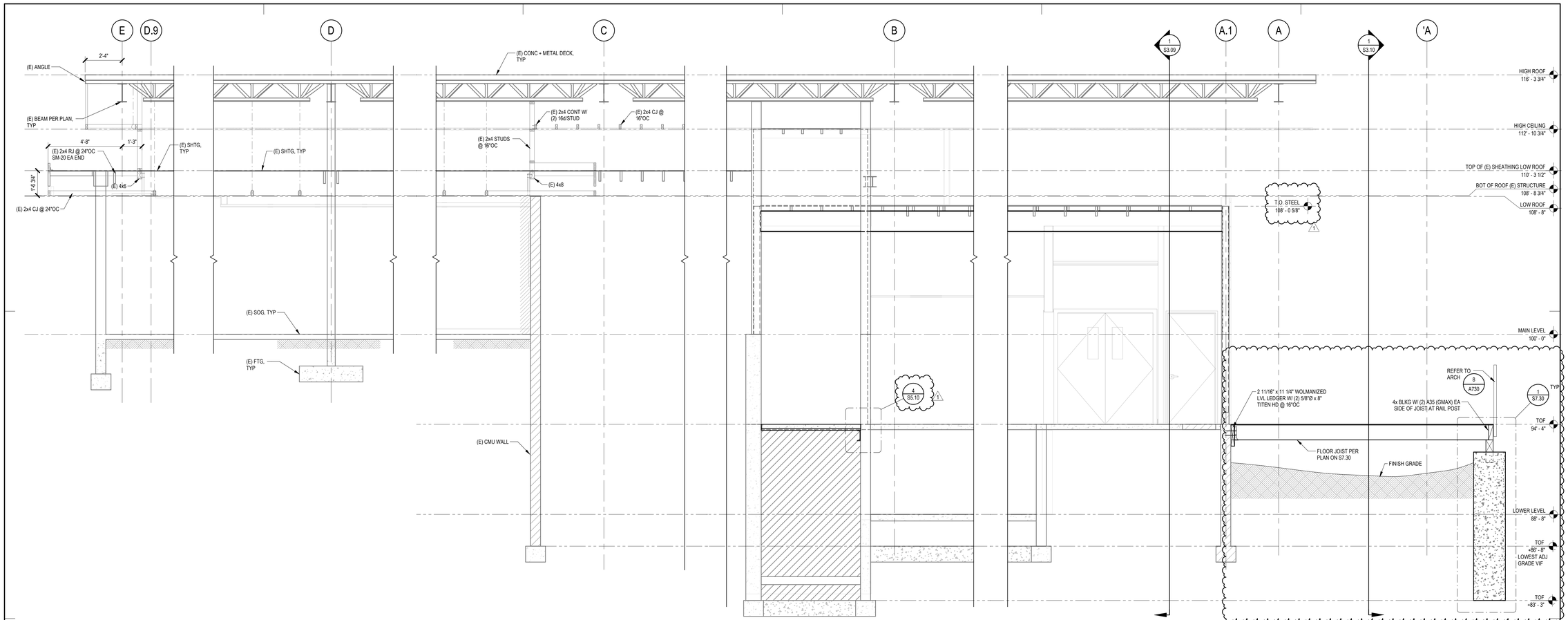
WALL ELEVATIONS

SCALE: 1/4" = 1'-0"

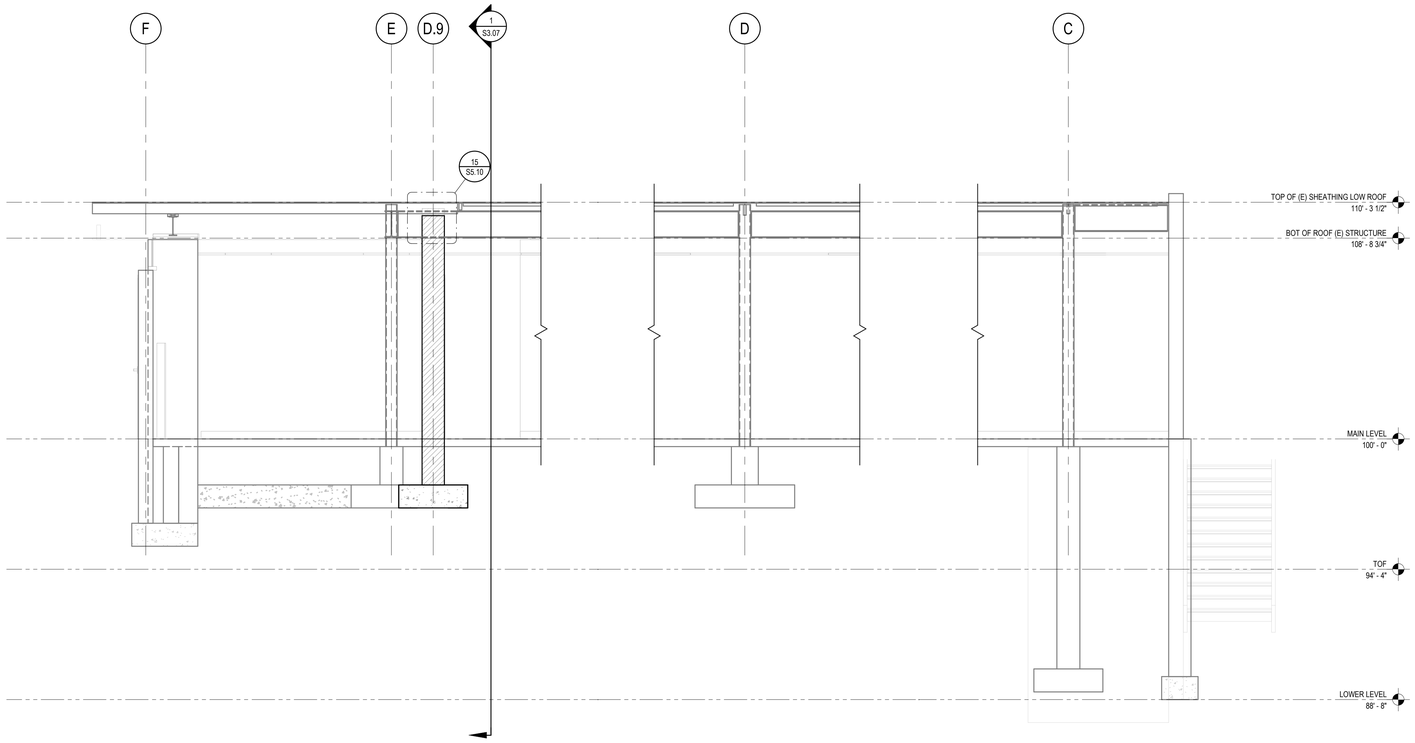
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.00

11/6/2024 4:39:14 PM



1 BUILDING SECTION
3/8" = 1'-0"



2 BUILDING SECTION
3/8" = 1'-0"

11/6/2024 4:39:15 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA. 91762
MI22080001.00 - v20
T: (800) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — RAHUL L. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

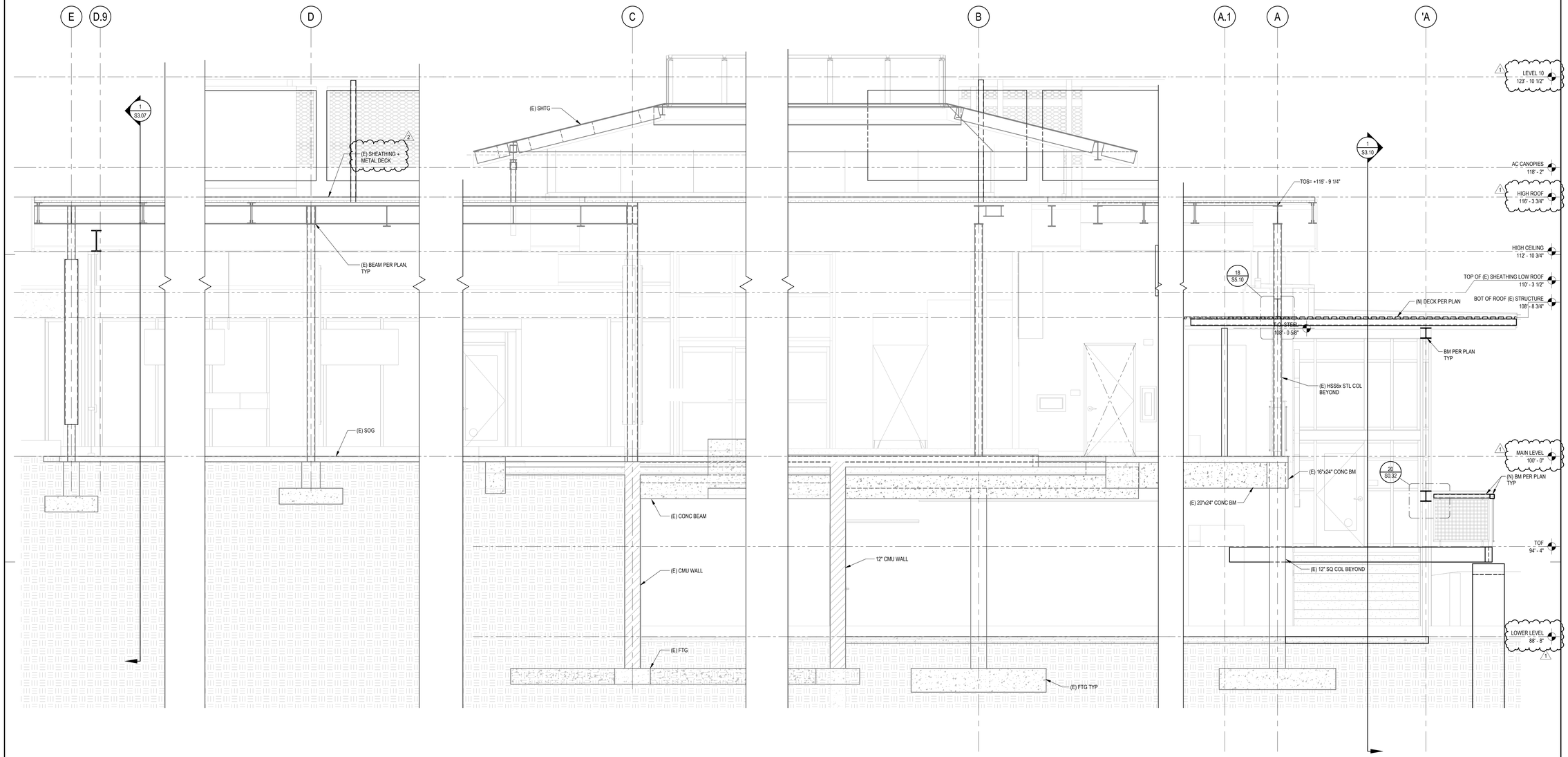
SHEET TITLE:

BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.02



1 BUILDING SECTION
3/8" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA, 91762
M0228001.00 - x00

T: (909) 270-9648
miyamotointernational.com

FRANK L. PETCOFF-PETERS
C 69880
CIVIL
STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

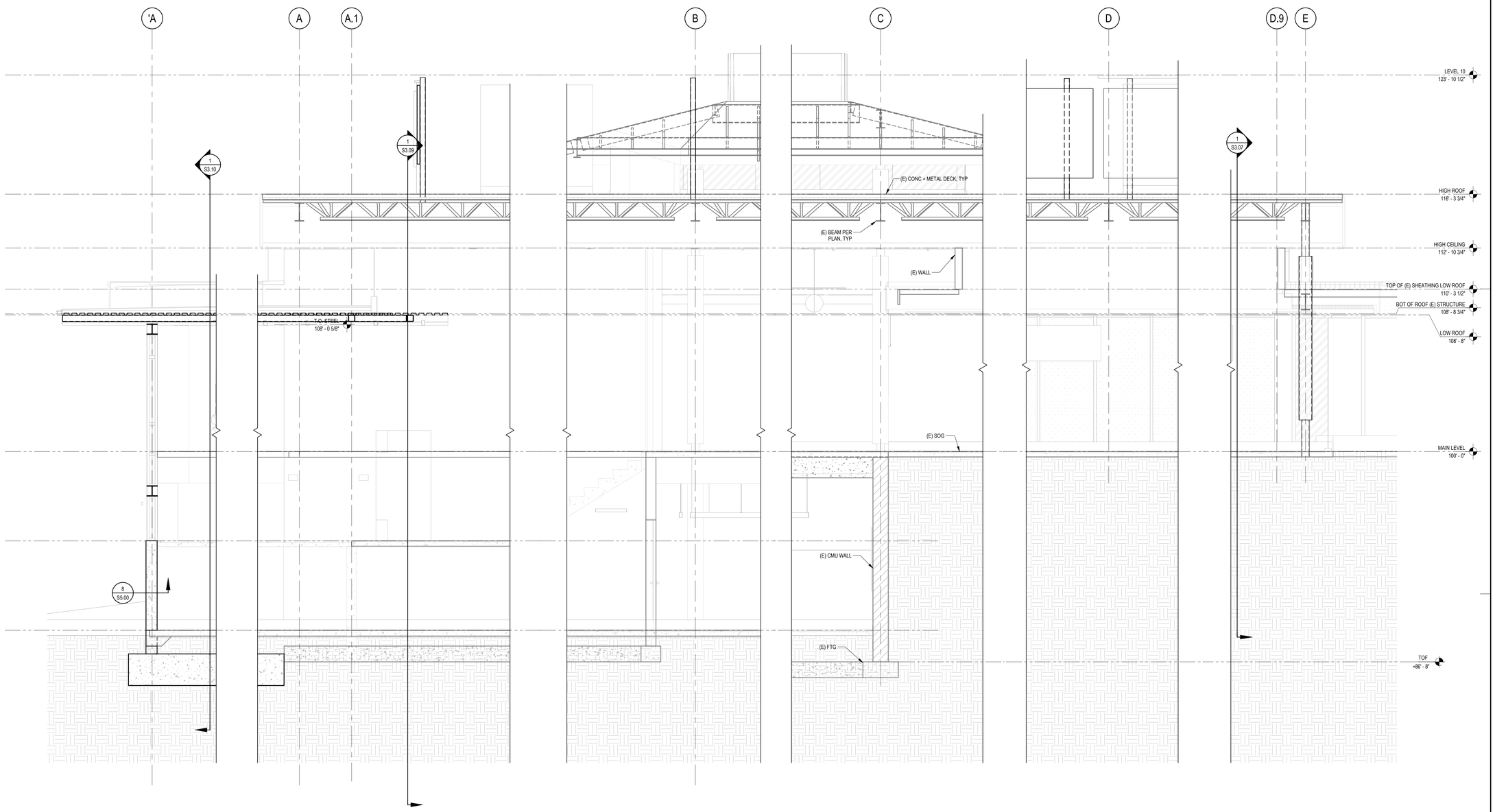
BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.03

11/6/2024 4:39:18 PM



1 BUILDING SECTION
3/8" = 1'-0"

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA 91762
MI22080K01-00 - v20
T: (833) 270-9646
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER – PETCOFF – C 69880 – CIVIL – STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

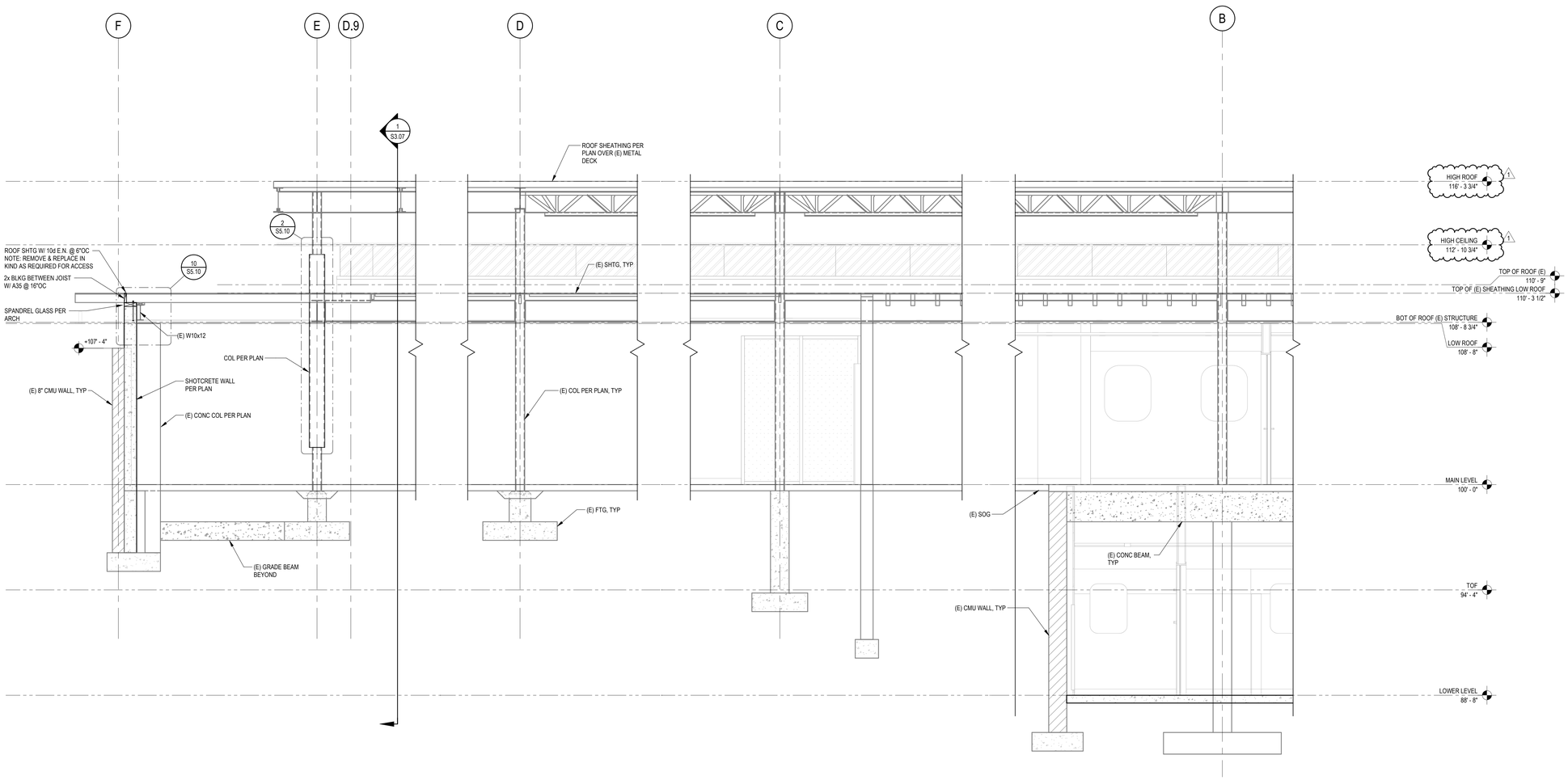
BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.05

11/6/2024 3:39:22 PM



1 BUILDING SECTION
3/8" = 1'-0"

11/6/2024 4:39:23 PM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA. 91762
MI22080001.00 - v20

T: (800) 270-8848
miyamotointernational.com

REGISTERED PROFESSIONAL ENGINEER
RAFAEL L. PETCOFF
C 69880
CIVIL
STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

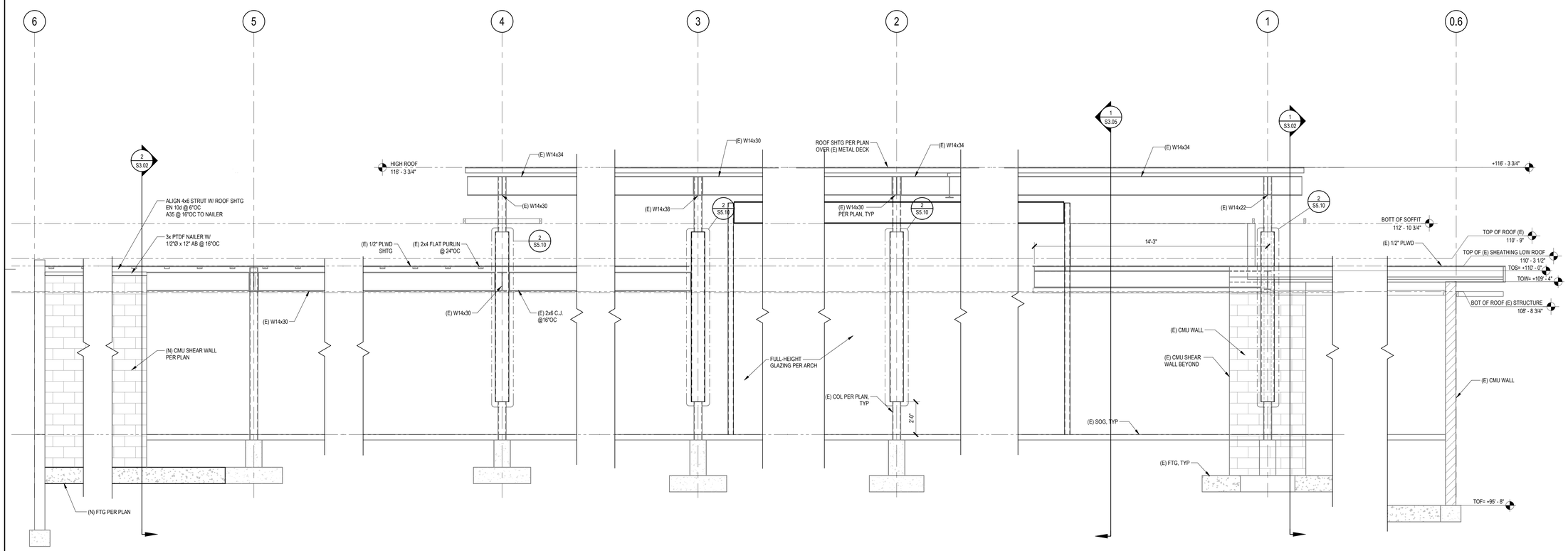
SHEET TITLE:

BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

S3.06



1 SECTION AT GRID E

3/8" = 1'-0"

11/6/2024 4:39:24 PM

ABA

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M0220600100 - v20

T: (800) 270-6848
miyamotointernational.com

STAMP

TRAVIS V. PETCOFF — C 69888 — CIVIL — LICENSED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

11/6/2024

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

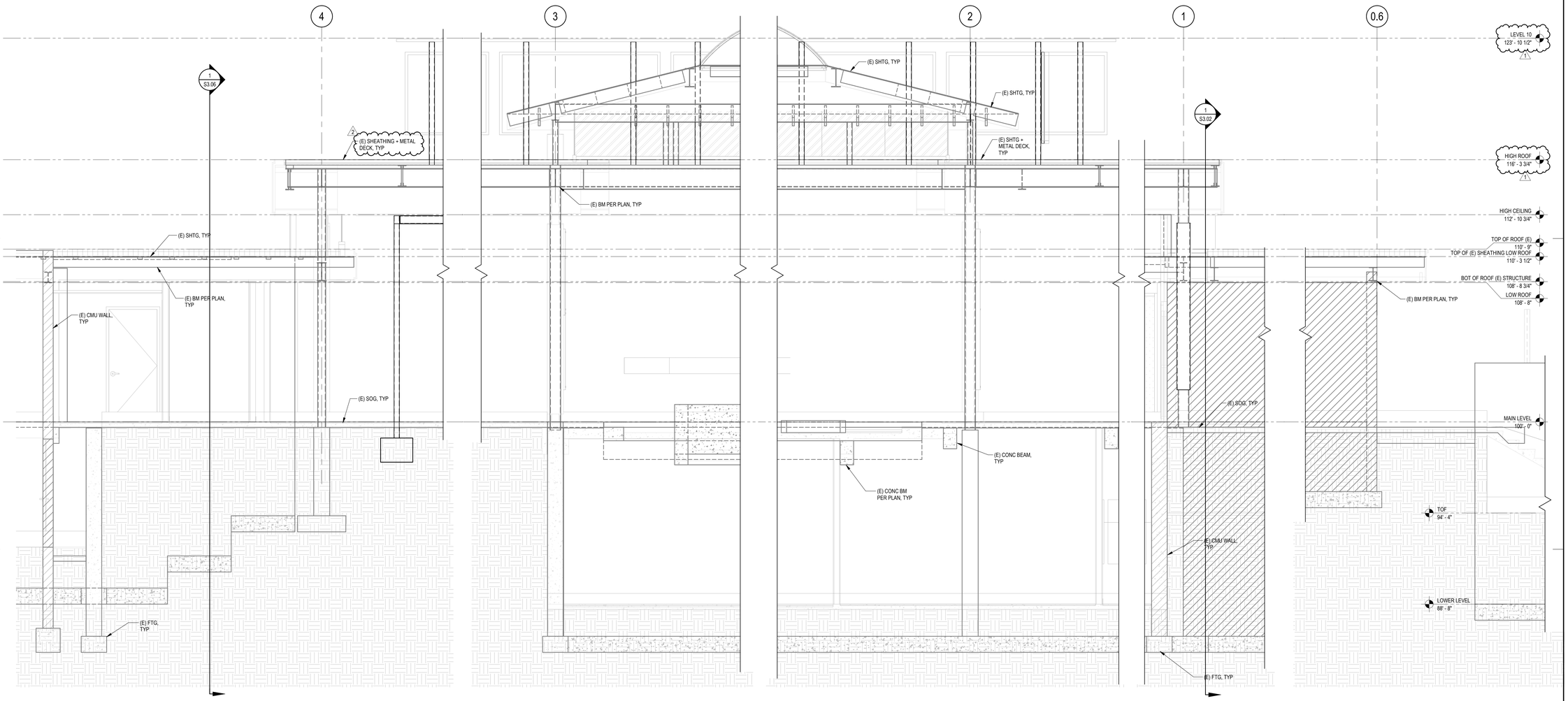
SHEET TITLE:

BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.07



1 SECTION
3/8" = 1'-0"

11/6/2024 4:39:27 PM

ABA

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA. 91762
M0220600100 - v00

T: (800) 270-8648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
FRANK L. PETCOFF
C 69880
CIVIL
STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

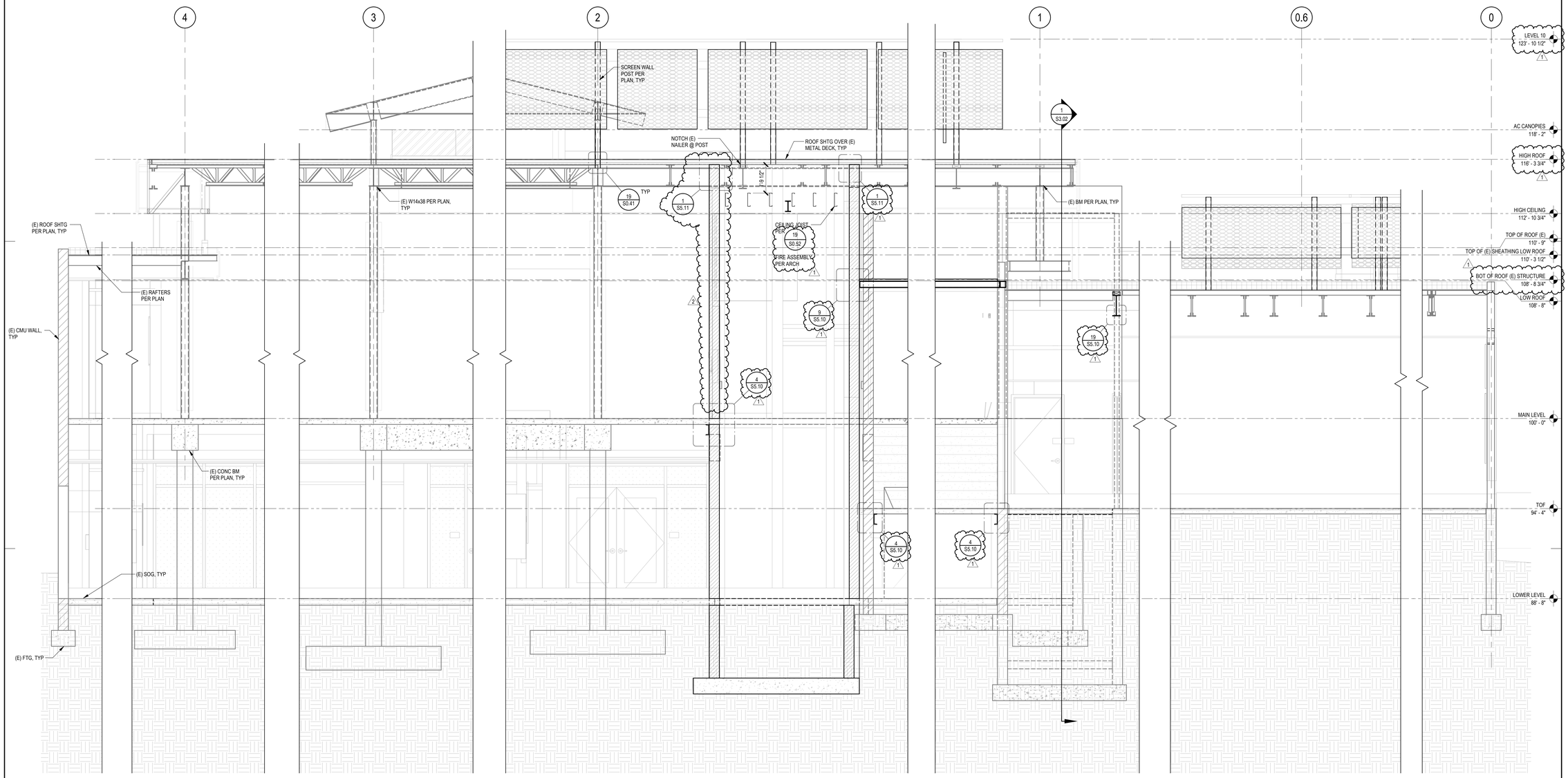
SHEET TITLE:

BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.08



1 SECTION
3/8" = 1'-0"

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MI22080/01.00 - v20

T: (833) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

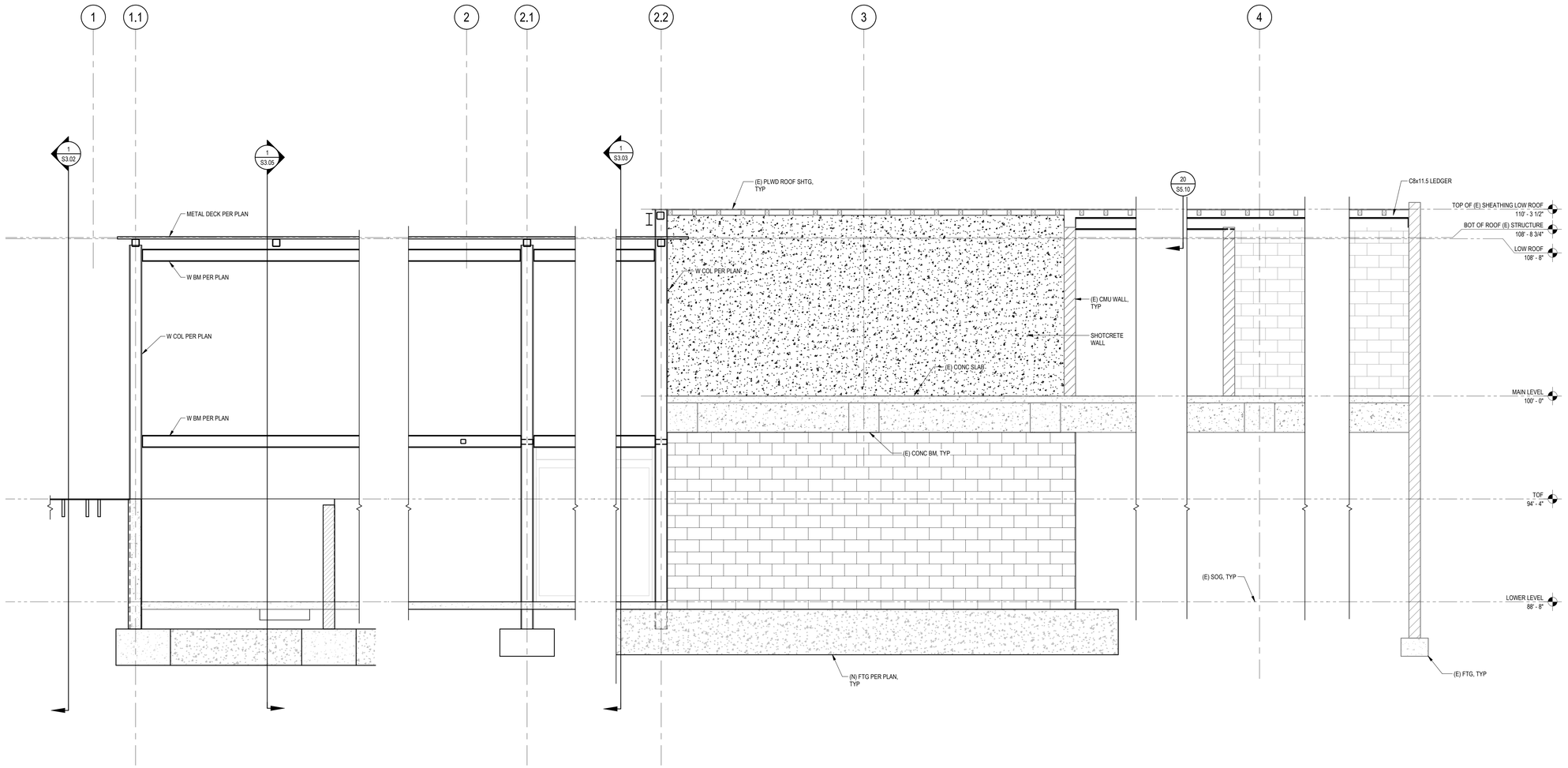
BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.09

11/6/2024 4:39:30 PM



1 SECTION
3/8" = 1'-0"

11/6/2024 4:39:31 PM

ABA

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M0220601.00 - v20

T: (909) 270-8648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — TRAVIS J. PETCOFF — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

BUILDING SECTIONS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S3.10

SHEARWALL SCHEDULE

MARK	PLYWOOD OR OSB SHEATHING[11]	EDGE NAILING (EN)	SILL NAILING (SN)	SILL BOLTING (SB)	FOUNDATION SILL PL	OTHER SILL PL[5]	TOP PL	CAPACITY (ASD)
A	15/32" CDX 4-PLY (MIN) SHTG (32/16) OR 15/32" OSB SHTG (32/16) ONE SIDE	10d @ 6"OC	SEE TABLE BELOW	5/8"Ø x9" EMBED CAST-IN ANCHOR BOLT OR 5/8"Ø x8" EMBED SIMPSON TITEN HD SCREW ANCHOR @ 48"OC	2x	2x	(2) 2x	310 PLF

*INDICATES WITH 4 1/4" EMBEDMENT INTO MINIMUM 1 3/4" TIMBER STRAND BLOCKING OR RIM JOIST. MINIMUM EDGE DISTANCE SHALL BE 3/4". USE FULL BODY DIAMETER LAG SCREWS ONLY.
**SIMPSON LTP4 LONG SIDE SHOULD BE PARALLEL TO WALL/SHEAR DIRECTION.

NOTES:
1. INTERMEDIATE NAILING SHALL BE 10d @ 12"OC, UNO.
2. THE FOUNDATION SILL PLATE AND FRAMING, INCLUDING BLOCKING, AT ADJOINING PANEL EDGES SHALL BE 3x MIN AND NAILS SHALL BE STAGGERED WHERE SHEARWALL CAPACITY INDICATED ABOVE EXCEEDS 350 PLF.
3. WHERE PANELS ARE APPLIED ON BOTH FACES OF A WALL AND NAIL SPACING IS LESS THAN 6"OC (152mm) ON EITHER SIDE, PANEL JOINTS SHALL BE OFFSET TO FALL ON DIFFERENT FRAMING MEMBERS OR FRAMING SHALL BE 3" (76mm) NOMINAL OR THICKER AND NAILS ON EACH SIDE SHALL BE STAGGERED.
4. USE OF MACHINE NAILING IS SUBJECT TO APPROVAL BY THE PROJECT STRUCTURAL ENGINEER. WITH APPROVAL, MACHINE NAILING IS SUBJECT TO THE DEMONSTRATION OF CONTINUOUS SATISFACTORY JOBSITE PERFORMANCE. IF NAIL HEADS PENETRATE THE OUTER PLY MORE THAN WOULD BE NORMAL FOR A HAND HAMMER, OR IF MINIMUM EDGE DISTANCES ARE NOT MAINTAINED, THE PERFORMANCE WILL BE DEEMED UNSATISFACTORY.
5. NO PANEL LESS THAN 12" WIDE SHALL BE USED IN VERTICAL SHEARWALLS.
6. ALL SILL BOLTS SHALL HAVE A 0.229" x 3" SQ MIN PLATE WASHER UNDER NUT. WHERE SHEARWALL CAPACITY INDICATED ABOVE EXCEEDS 200 PLF, THE PLATE WASHER SHALL EXTEND TO WITHIN 1/2" OF THE EDGE OF THE BOTTOM PLATE ON THE SIDE(S) WITH SHEATHING.
7. SIMPSON TITEN HD SCREW ANCHORS SHALL BE INSTALLED PER ICC ESR-2713.
8. NAILS SHALL BE COMMON OR GALVANIZED (HOT-DIPPED OR TUMBLED) BOX NAILS AND SHALL BE PLACED NOT LESS THAN 1/2" EDGE DISTANCE FROM THE PANEL EDGES AND 3/8" FROM THE EDGE OF THE CONNECTING MEMBERS.
9. PLYWOOD EN & SN SHALL BE STAGGERED.
10. FOUNDATION SILL PLATES ARE THOSE PLACED AGAINST CONCRETE & RECEIVING SILL BOLTING.
11. NAILS SHALL BE LOCATED AT LEAST 1/2" FROM PANEL EDGES AND 3/8" FROM THE EDGE OF THE CONNECTING MEMBERS. MAXIMUM NAIL SPACING AT PANEL EDGES SHALL BE 6" OC.NAILS SHALL BE LOCATED AT LEAST 1/2" FROM PANEL EDGES AND 3/8" FROM THE EDGE OF THE CONNECTING MEMBERS. MAXIMUM NAIL SPACING AT PANEL EDGES SHALL BE 6" OC.
12. HOLD-DOWN CONNECTOR BOLTS REQUIRE STEEL PLATE WASHER ON THE OPPOSITE SIDE OF POST. PLATE SIZE SHALL BE A MINIMUM OF 0.299" x 3" SQ.
13. HOLD-DOWN HARDWARE MUST BE SECURED IN PLACE PRIOR TO FOUNDATION INSPECTION.
14. SIMPSON MASA FOUNDATION ANCHOR STRAPS SHALL BE INSTALLED PER ICC ESR-2555. THE MINIMUM ANCHOR END DISTANCE IS 4", THE MINIMUM ANCHOR SPACING IS 8", AND THE MINIMUM CONCRETE STEM WALL WIDTH IS 6".
15. OSB NOT ALLOWED ON EXTERIOR VERTICAL SURFACES.

PAD FOOTING SCHEDULE

MARK	LENGTH/WIDTH	THICKNESS	REINFORCING	REMARKS
F1	36" SQ	18"	(4) #5 EA WAY BOTT	

NOTE:
COMBINE REINFORCEMENT AT ADJACENT FOOTINGS AS REQUIRED.

WALL FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	LONGITUDINAL REINFORCING	TRANSVERSE REINFORCING	REMARKS
WF1	60"	30"	(5) #5 TOP & BOTT	#6 @ 12"OC TOP & BOTT	
WF2	30"	24"	(3) #5 TOP & BOTT	N/A	

NOTE:
COMBINE REINFORCEMENT AT ADJACENT FOOTINGS AS REQUIRED.

COLUMN SCHEDULE

MARK	SIZE	BASEPLATE	REMARKS
C1	HSS6x4x1/2		15/S0.32
C2	W8x40	3/4"x8 1/2"x1'-0"	15/S0.32
C3	HSS4x4x1/4		15/S0.32

CMU WALL SCHEDULE

ID	THICKNESS	REINFORCING
W8	8"	#5 @ 16"OC VERT AND HORIZ SOLID GROUT
W12	12"	#5 @ 16"OC EF VERT AND HORIZ SOLID GROUT, STACKED BOND
W16	16"	#5 @ 16"OC EF VERT AND HORIZ SOLID GROUT, STACKED BOND

1 2

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.
1047 West Sixth Street, Suite A
Ontario, CA 91762
MI0289001.00 - v20
T: (833) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER
RAFAEL L. PETCOFF REYES
C 69880
CIVIL
STATE OF CALIFORNIA
11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 11-07-2024

SHEET TITLE:

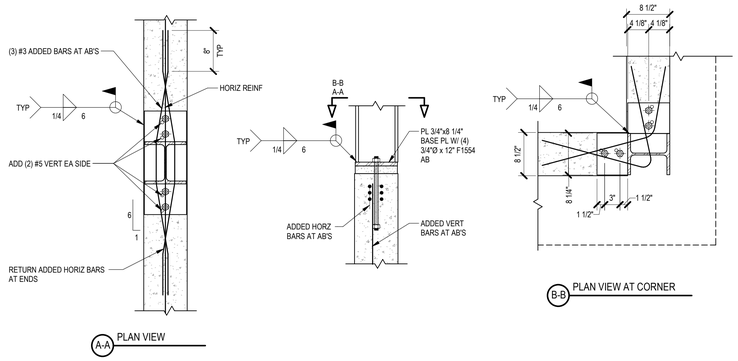
FOUNDATION LEGEND AND SCHEDULES

SCALE: 1" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

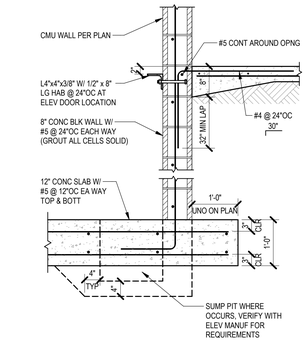
S4.00

11/6/2024 4:39:32 PM



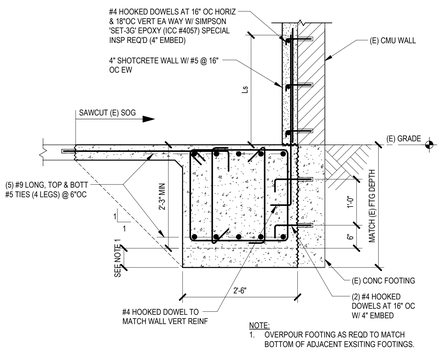
13 ADDED REBAR AT COLUMN ANCHORAGE

1" = 1'-0"



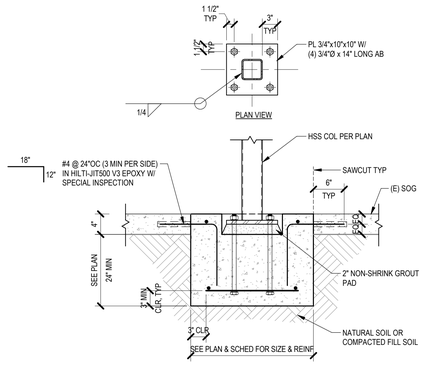
5 ELEVATOR PIT AT NEW WALL

3/4" = 1'-0"



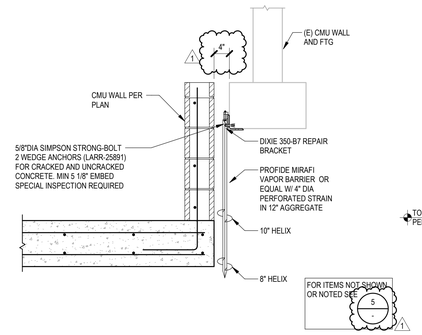
1 SECTION AT (N) FOOTING

3/4" = 1'-0"



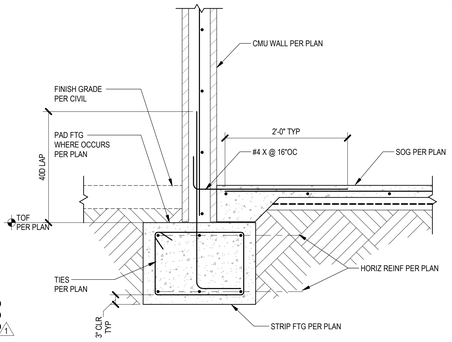
10 NEW COLUMN TO PAD FOOTING

1" = 1'-0"



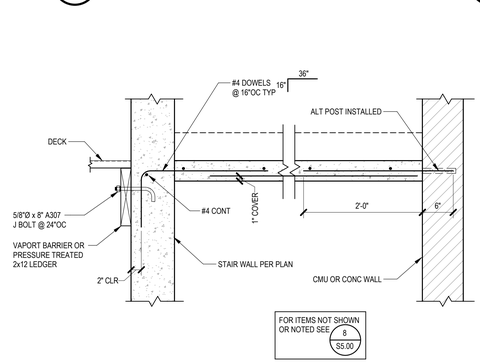
6 ELEVATOR PIT AT EXISTING WALL

3/4" = 1'-0"



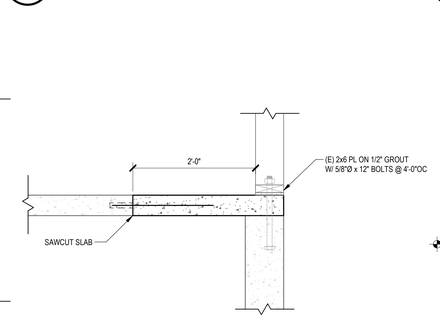
2 EXTERIOR CMU WALL FOOTING

1" = 1'-0"



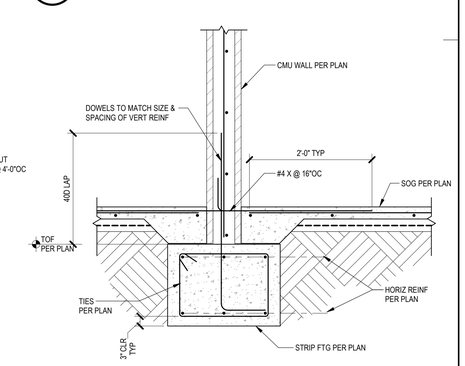
11 ELEVATED STAIR

1" = 1'-0"



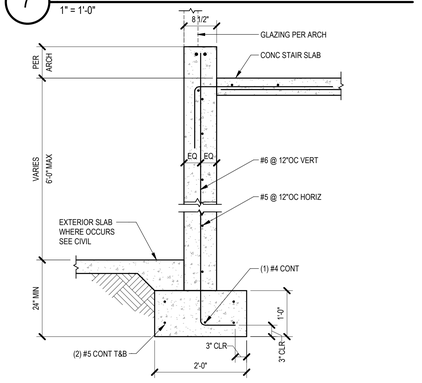
7 NEW DOOR TRACK

1" = 1'-0"



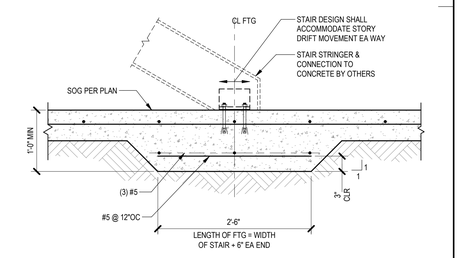
3 INTERIOR CMU WALL FOOTING

1" = 1'-0"



8 EXTERIOR STAIR WALL

3/4" = 1'-0"



4 STAIR STRINGER FOOTING

1" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
T: (800) 270-9648
miyamotointernational.com
M0220600.00 - v20

LICENSED PROFESSIONAL ENGINEER — PETCOFF, WILLIAM — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	05/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 11-07-2024

SHEET TITLE:

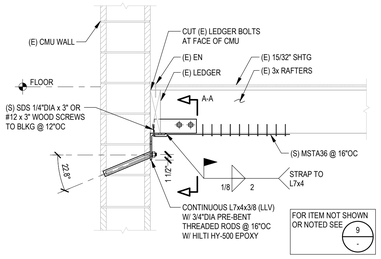
FOUNDATION DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

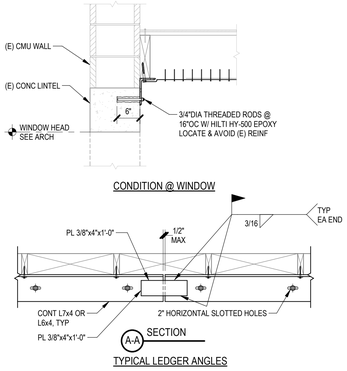
S5.00

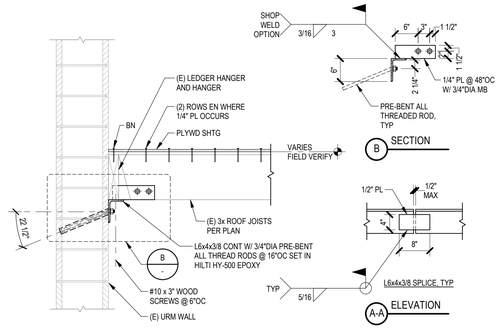
11/6/2024 4:39:34 PM



17 SLIDING LEDGER AT NON-PARTICIPATING WALL

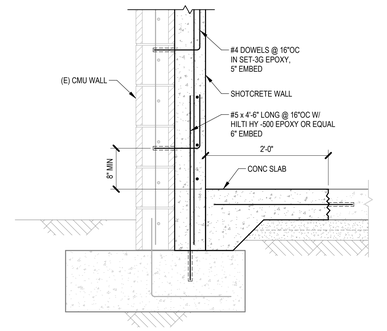
3/4" = 1'-0"





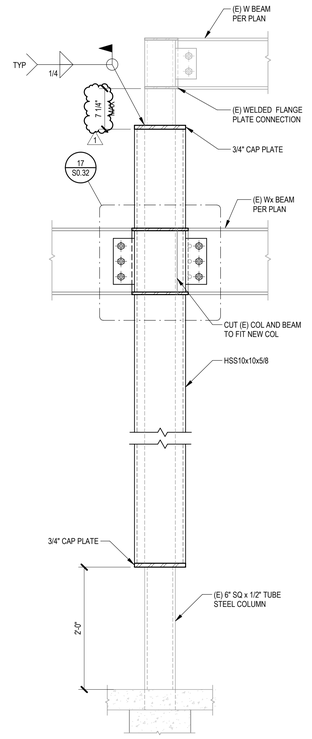
9 ROOF ANCHORAGE AT CMU WALL

3/4" = 1'-0"



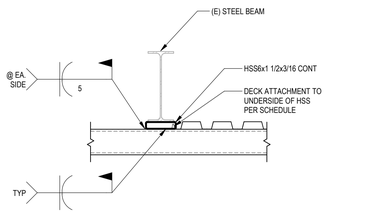
5 SHOTCRETE AT (E) FOOTING

1" = 1'-0"



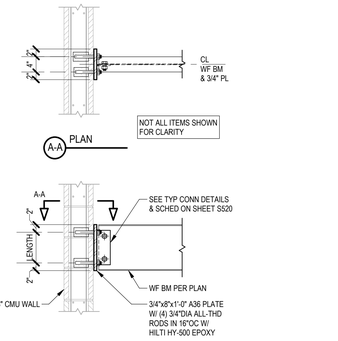
2 REINFORCED FRAME COLUMN

1" = 1'-0"



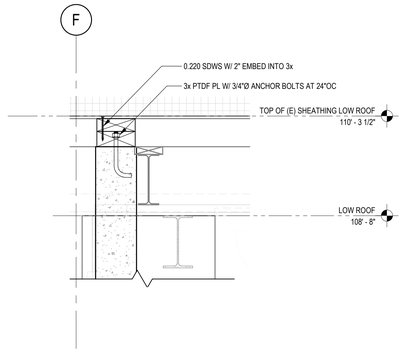
18 CANOPY TO EXISTING

1" = 1'-0"



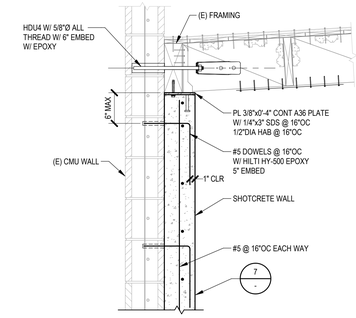
14 STEEL BEAM TO CMU

3/4" = 1'-0"



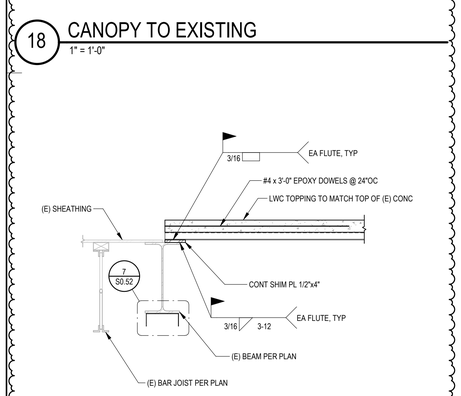
10 DETAIL

1" = 1'-0"



6 DETAIL

1" = 1'-0"

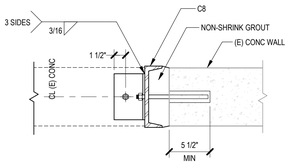


19 DETAIL

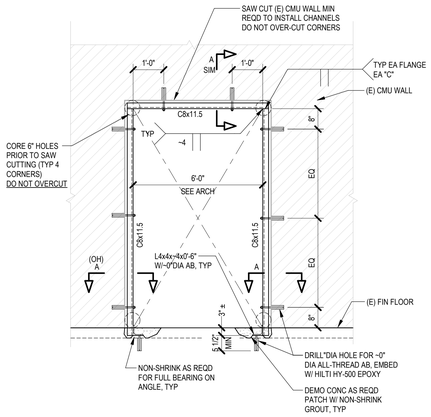
1" = 1'-0"

15 INTERIOR CMU WALL ANCHORAGE

1" = 1'-0"

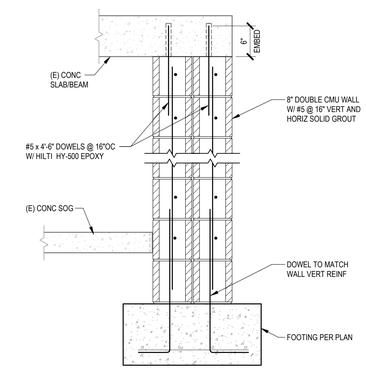


DETAIL-A



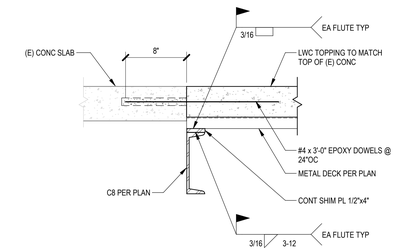
12 NEW OPENING AT CMU WALL

1/2" = 1'-0"



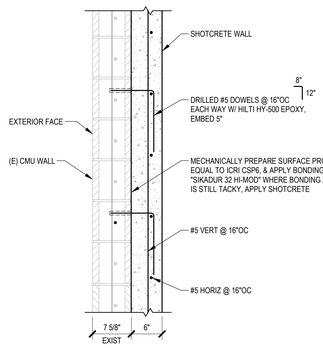
8 CMU WALL AT (E) BEAM

1" = 1'-0"



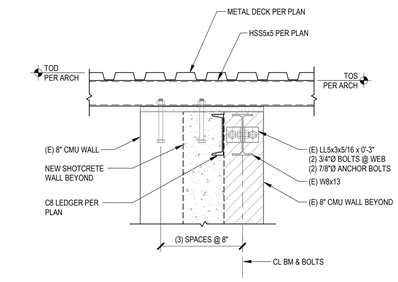
4 ELEVATED CONCRETE SLAB INFILL

1 1/2" = 1'-0"



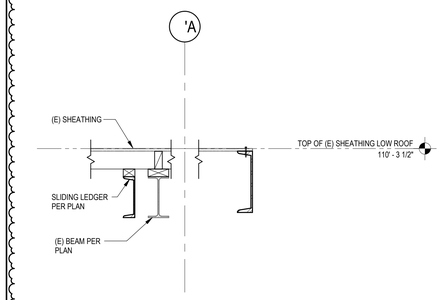
7 SHOTCRETE AT (E) CMU

1" = 1'-0"



3 NEW LEDGER TO SHOTCRETE WALL

1" = 1'-0"



20 DETAIL

1" = 1'-0"

11/6/2024 4:39:37 PM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
M0220600100 - v20
T: (800) 270-8848
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — FRANK J. PETCOFF — C 69888 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
-	06/24/2024	BUILDING PERMIT SUBMITTAL
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

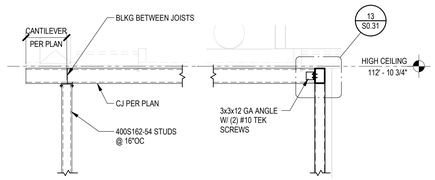
SHEET TITLE:

FRAMING DETAILS

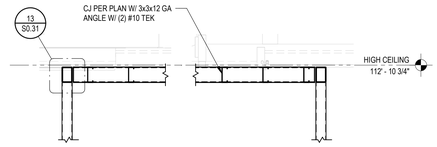
SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

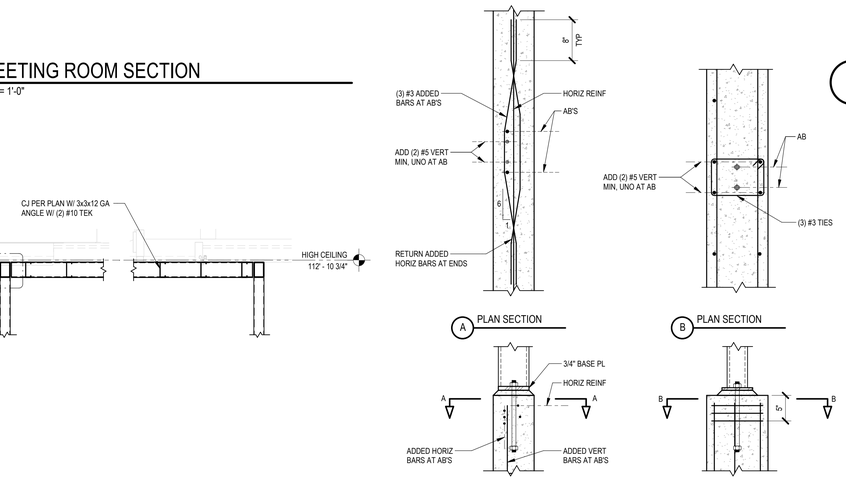
S5.10



9 MEETING ROOM SECTION
1/2" = 1'-0"

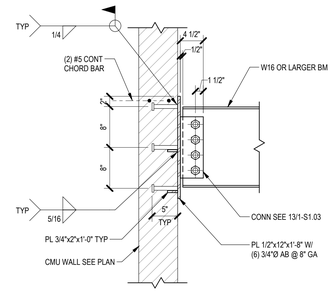


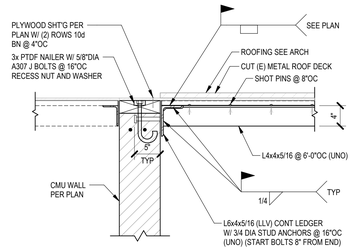
10 MEETING ROOM SECTION
1/2" = 1'-0"



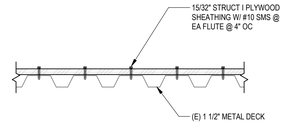
6 ADDED REBAR AT COLUMN ANCHORAGE
1" = 1'-0"

1 CMU WALL AT (E) DECK
1" = 1'-0"

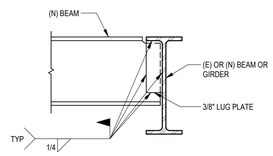




11 SHEATHING OVER (E) METAL DECK
1 1/2" = 1'-0"

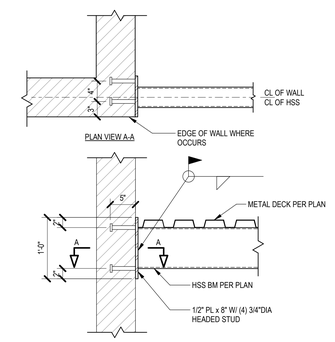


7 NEW TO EXISTING BEAM
1" = 1'-0"

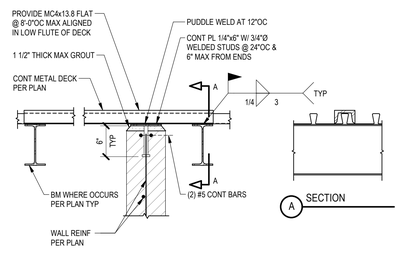


NOTE: WELD ALL NEW BEAMS FROM UNDERSIDE TO METAL DECK W/ 1/8" FILLET WELDS AT 12"OC MAX ALIGN (N) PARALLEL BEAMS WITH METAL DECK LOW FLUTIES

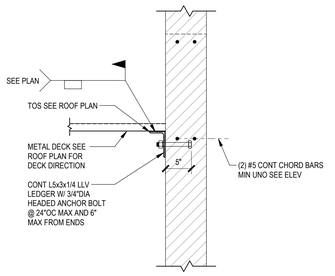
3 HSS TO CMU WALL
1" = 1'-0"



8 TOP OF CMU WALL
1" = 1'-0"



4 TYPICAL ANGLE LEDGER
1" = 1'-0"



ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MI02290001.00 - v00
T: (833) 270-9648
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER — RAFAEL PETCOFF ANTON — C 69880 — CIVIL — STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

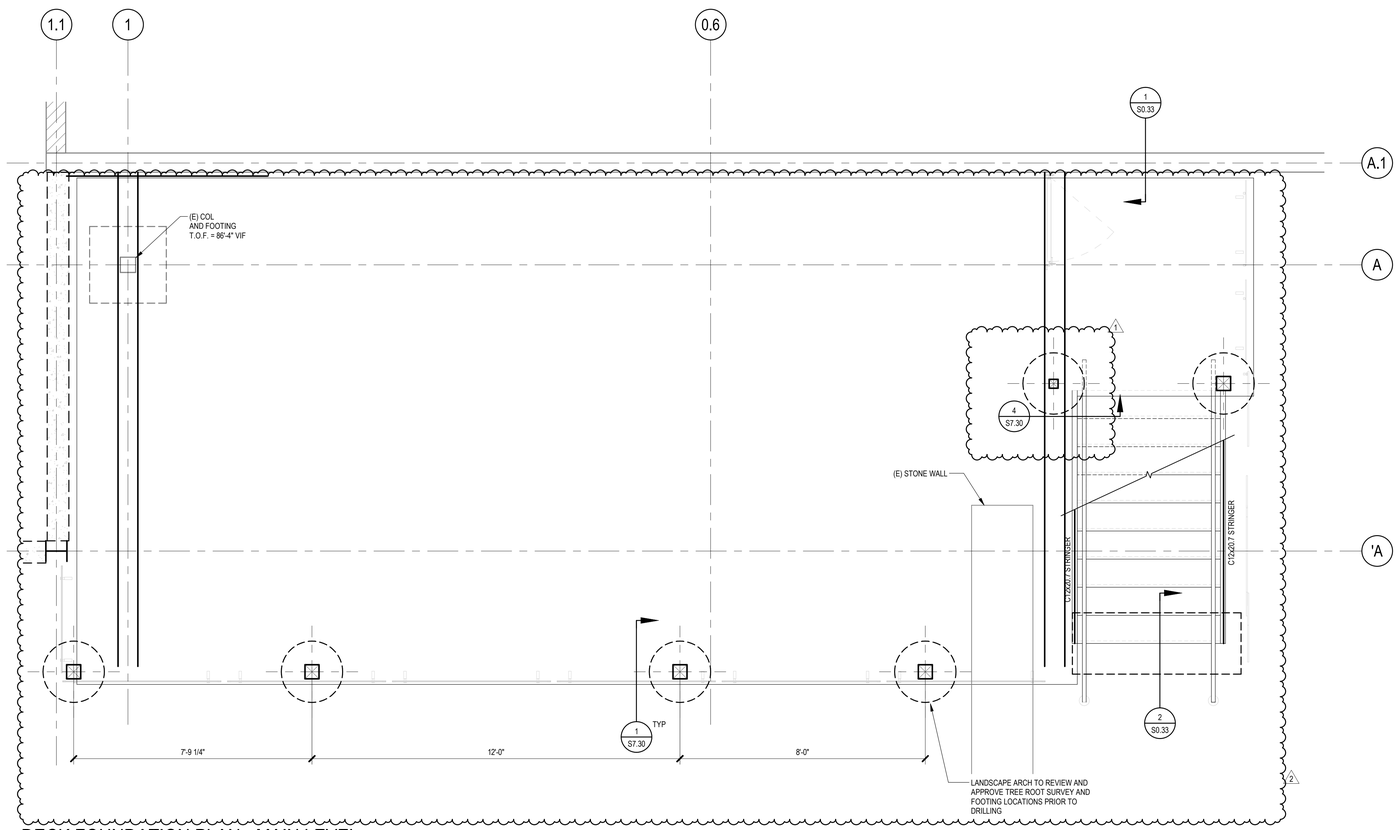
FRAMING DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

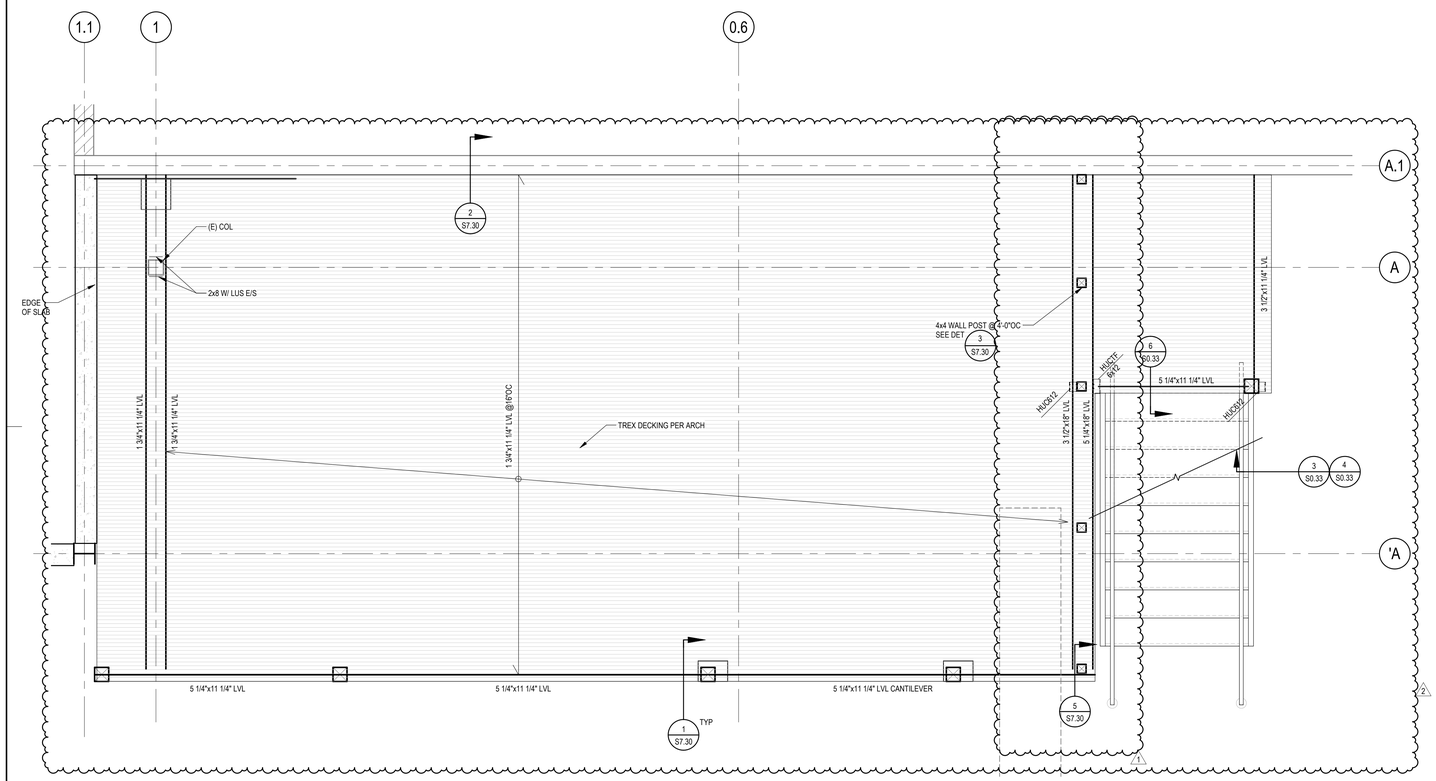
S5.11

11/6/2024 4:39:40 PM



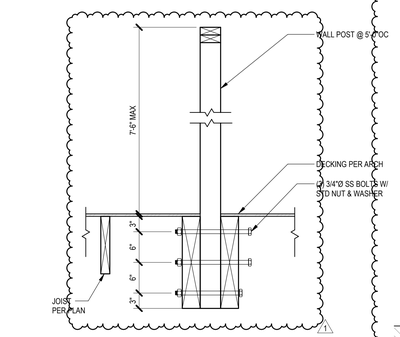
DECK FOUNDATION PLAN - MAIN LEVEL

1/2" = 1'-0"



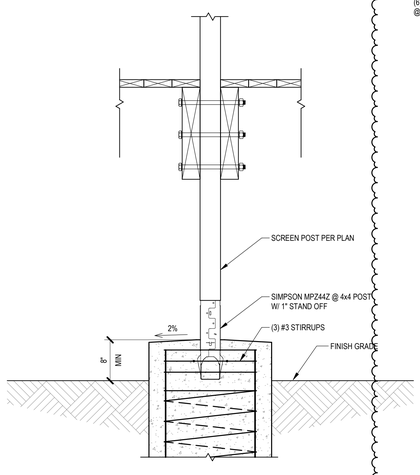
DECK FRAMING PLAN - MAIN LEVEL

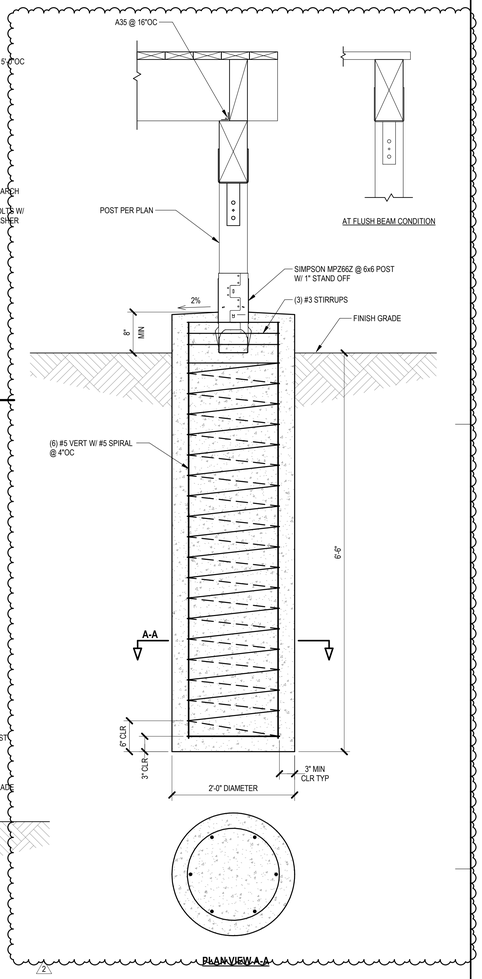
1/2" = 1'-0"



3 SCREENWALL DETAIL

1" = 1'-0"

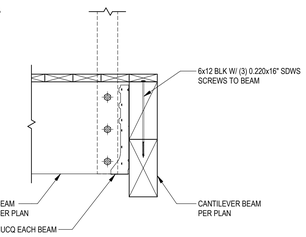




PLAN VIEW A-A

4 SCREEN POST AT PIER

1" = 1'-0"

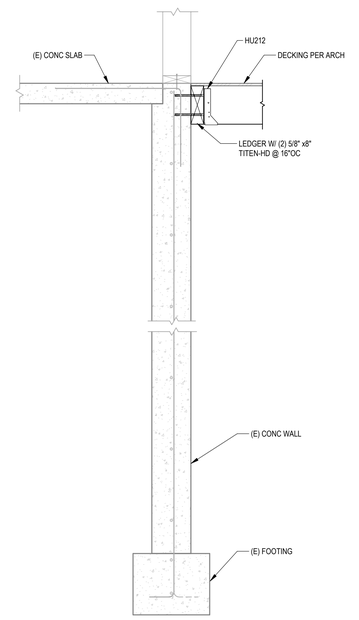


5 SCREEN POST AT CANTILEVER

1" = 1'-0"

1 WOOD POST TO PAD FOOTING

1" = 1'-0"



2 LEDGER DETAIL

1" = 1'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

miyamoto.

1047 West Sixth Street, Suite A
Ontario, CA 91762
MI02080K01-00 - v20
T: (833) 270-9646
miyamotointernational.com

LICENSED PROFESSIONAL ENGINEER - PETCOFF - C 69880 - CIVIL - STATE OF CALIFORNIA

11/6/2024

STAMP

NO.	DATE	REVISIONS
1	11/06/2024	BACKCHECK #1 BLDG PERMIT SUBMITTAL
2	11/06/2024	INTERNAL BACKCHECK REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	11-07-2024

SHEET TITLE:

DECK DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

S7.30

11/6/2024 3:39:42 PM

MECHANICAL SYMBOLS

	CD	CEILING DIFFUSER - SUPPLY
	SAD	SUPPLY AIR DUCT - RISER
	SAD	SUPPLY AIR DUCT - DROP
	RAG	RETURN AIR GRILLE
	RAD	RETURN AIR DUCT - RISER
	RAD	RETURN AIR DUCT - DROP
	EAG	EXHAUST AIR GRILLE
	EAD	EXHAUST AIR DUCT - RISER
	EAD	EXHAUST AIR DUCT - DROP
	SWS	SIDE WALL SUPPLY GRILLE
	SWR	SIDE WALL RETURN/EXHAUST GRILLE
UP		DUCT OFFSET UP
		LINED DUCT
		DUCT OR EQUIPMENT TO BE REMOVED
		EXISTING DUCT TO REMAIN
		DUCT
		DUCT TRANSITION
	MVD	MANUAL VOLUME DAMPER
BDD	BDD	BACKDRAFT DAMPER
	AFD	AUTOMATIC FIRE DAMPER
	CSFD	COMBINATION SMOKE/FIRE DAMPER
CHWS		CHILLED WATER SUPPLY PIPE
CHWR		CHILLED WATER RETURN PIPE
HWS		HOT WATER SUPPLY PIPE
HWR		HOT WATER RETURN PIPE
CWS		CONDENSER WATER SUPPLY PIPE
CWR		CONDENSER WATER RETURN PIPE

		PRESSURE REDUCING VALVE
		ISOLATION VALVE (BALL)
		ISOLATION VALVE (BUTTERFLY)
		MOTORIZED CONTROL VALVE
		CHECK VALVE
		THERMOMETER
P		PRESSURE GAUGE
2"		**SMACNA DUCT STATIC PRESSURE CLASS**
	POD	POINT OF DEMOLITION
	POC	POINT OF CONNECTION
M		MOTORIZED DAMPER
T / TS		THERMOSTAT / SENSOR. MOUNT @ +48" AFF (IF MOUNTED OVER CASEWORK OR OTHER OBSTRUCTION 46" TO TOP OF DEVICE).
TC		TIME CLOCK
DD		DUCT SMOKE DETECTOR (MOUNT BELOW ROOF)
CO_2		CARBON DIOXIDE SENSOR FOR OUTSIDE AIR MODULATION
$D/L^{1.0}$	DL	DOOR LOUVER W/ MINIMUM FREE AREA (SQ. FT.)
W/C	UC	UNDER CUT DOOR

DETAIL NUMBER / DETAIL DESIGNATION (M-X) / DRAWING NUMBER

EQUIPMENT DESCRIPTION / EQUIPMENT DESIGNATION / EQUIPMENT NUMBER

MECHANICAL MANDATORY MEASURES

EQUIPMENT AND SYSTEMS EFFICIENCY

ANY APPLIANCE FOR WHICH THERE IS A CALIFORNIA STANDARD ESTABLISHED IN THE APPLIANCE EFFICIENCY STANDARDS SHALL COMPLY WITH THAT STANDARD.

PIPING, EXCEPT THOSE CONVEYING FLUIDS WITH A DESIGN OPERATING TEMPERATURE BETWEEN 60° F AND 105°F, OR WITHIN SPACE-CONDITIONING EQUIPMENT CERTIFIED UNDER, § 110.1 OR § 110.2, SHALL BE INSULATED IN ACCORDANCE WITH § 120.3

ALL AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS ARE REQUIRED TO BE INSTALLED, SEALED, AND INSULATED IN ACCORDANCE WITH THE CALIFORNIA MECHANICAL CODE (CMC) SECTIONS 601, 602, 603, 604, 605 AND ANSI/SMACNA-006-2006 HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE 3RD EDITION.

ALL OUTDOOR OR RE-CIRCULATED AIR SUPPLIED TO OCCUPIABLE SPACES IS FILTERED (MIN. MERV 13) BEFORE PASSING THROUGH ANY AIR CONDITIONING COMPONENT.

ALL FACTORY-FABRICATED AND FIELD-FABRICATED DUCT SYSTEMS SHALL COMPLY WITH UL181.

NEW DUCT SYSTEMS THAT ARE NOT SUBJECT TO TESTING UNDER SECTION 120.4(g)1 SHALL INSTEAD MEET THE DUCT LEAKAGE TESTING REQUIREMENTS OF CMC SECTION 603.10.1

VENTILATION

CONTROLS SHALL BE PROVIDED TO ALLOW OUTSIDE AIR DAMPERS OR DEVICES TO BE OPERATED AT THE VENTILATION RATES AS SPECIFIED IN THESE PLANS.

ALL GRAVITY VENTILATING SYSTEMS SHALL BE PROVIDED WITH AUTOMATIC OR READILY ACCESSIBLE MANUALLY OPERATED DAMPERS IN ALL OPENINGS TO THE OUTSIDE.

AIR BALANCING: ALL SPACE CONDITIONING AND VENTILATION SYSTEMS SHALL BE BALANCED TO THE QUANTITIES SPECIFIED IN THESE PLANS, IN ACCORDANCE WITH THE ASSOCIATED AIR BALANCE COUNCIL (AABC) NATIONAL STANDARDS.

GRAVITY OR AUTOMATIC DAMPERS INTERLOCKED AND CLOSED ON FAN SHUTDOWN SHALL BE PROVIDED ON THE OUTSIDE AIR INTAKES AND DISCHARGES OF ALL SPACE CONDITIONING AND EXHAUST SYSTEMS.

FANS USED FOR VENTILATION SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS.

THE MINIMUM OUTDOOR AIR LISTED OR THREE COMPLETE AIR CHANGES SHALL BE SUPPLIED TO THE ENTIRE BLDG. DURING THE ONE HOUR PERIOD IMMEDIATELY BEFORE THE BLDG. IS NORMALLY OCCUPIED.

3 THE BUILDER SHALL PROVIDE THE BUILDING OWNER OR THE PERSON(S) RESPONSIBLE FOR THE BUILDING MAINTENANCE (IN CASE OF MULTI-TENANT OR CENTRALLY OPERATED BUILDINGS) AT OCCUPANCY A DESCRIPTION OF THE QUANTITIES OF OUTDOOR AND RECIRCULATED AIR THAT THE VENTILATION SYSTEMS ARE DESIGNED TO PROVIDE TO EACH AREA.

CONTROLS

EACH SPACE CONDITIONING ZONE SHALL BE CONTROLLED BY AN INDIVIDUAL THERMOSTATIC CONTROL THAT RESPONDS TO THE SUPPLY OF HEATING AND COOLING ENERGY WITHIN THAT ZONE S120.2(a). WHEN USED TO CONTROL HEATING, THE THERMOSTATIC CONTROL MUST BE ADJUSTABLE DOWN TO 55°F OR LOWER. FOR COOLING, THE THERMOSTATIC CONTROL MUST BE ADJUSTABLE UP TO 85°F OR HIGHER. WHEN USED TO CONTROL BOTH HEATING AND COOLING, THE THERMOSTATIC THE CONTROL MUST BE ADJUSTABLE FROM 55°F TO 85°F AND ALSO PROVIDE A DEAD BAND OF AT LEAST 5° F WITHIN WHICH THE SUPPLY OF HEATING AND COOLING IS SHUT OFF OR REDUCED TO A MINIMUM.

EACH SPACE CONDITIONING SYSTEM SERVING BUILDING TYPES SUCH AS OFFICES AND MANUFACTURING FACILITIES (AND ALL OTHERS NOT EXPLICITLY EXEMPT FROM THE REQUIREMENTS OF SECTION 112 (D)) SHALL BE INSTALLED WITH AN AUTOMATIC TIME SWITCH WITH AN ACCESSIBLE MANUAL OVERRIDE THAT ALLOWS OPERATION OF THE SYSTEM DURING OFF-HOURS FOR UP TO 4 HOURS. THE TIME SWITCH SHALL BE CAPABLE OF PROGRAMMING DIFFERENT SCHEDULES FOR WEEKDAYS OR WEEKENDS; INCORPORATE AN AUTOMATIC HOLIDAY "SHUTOFF" FEATURE THAT TURNS OFF ALL LOADS FOR AT LEAST 24 HOURS, THEN RESUMES THE NORMALLY SCHEDULED OPERATION; AND HAS PROGRAM BACKUP CAPABILITIES THAT PREVENT THE LOSS OF THE DEVICES PROGRAM AND TIME SETTING FOR AT LEAST 10 HOURS IF POWER IS INTERRUPTED.

SYSTEM WITH DDC TO THE S110.2(c) ARE ALSO REQUIRED TO HAVE AUTOMATIC DEMAND SHED CONTROLS.

EACH SPACE CONDITIONING SYSTEM MUST BE PROVIDED WITH CONTROLS THAT CAN AUTOMATICALLY SHUT OFF THE EQUIPMENT DURING UNOCCUPIED HOURS. WHEN SHUT DOWN, THE CONTROLS SHALL AUTOMATICALLY RESTART THE SYSTEM TO MAINTAIN A SETBACK HEATING THERMOSTAT SETPOINT, IF THE SYSTEM PROVIDES MECHANICAL HEATING AND SETUP COOLING THERMOSTAT SETPOINT, IF THE SYSTEM PROVIDES MECHANICAL COOLING.

THERMOSTATS SHALL HAVE NUMERIC SETPOINTS IN DEGREES FAHRENHEIT (F) AND ADJUSTABLE STOPS ACCESSIBLE ONLY BY AUTHORIZED PERSONNEL.

MAINTENANCE AND OPERATION

3 THE BUILDER SHALL PROVIDE THE BUILDING OWNER OR THE PERSON(S) RESPONSIBLE FOR THE BUILDING MAINTENANCE (IN CASE OF MULTI-TENANT OR CENTRALLY OPERATED BUILDINGS) AT OCCUPANCY THE FOLLOWING:

THE APPROPRIATE CERTIFICATE(S) OF COMPLIANCE AND A LIST OF THE FEATURES, MATERIALS, COMPONENTS, AND MECHANICAL DEVICES INSTALLED IN THE BUILDING AND INSTRUCTIONS ON HOW TO OPERATE THEM EFFICIENTLY

REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY STATED AND INCORPORATED ON A READILY ACCESSIBLE LABEL. THE LABEL MAY BE LIMITED TO IDENTIFYING THE OPERATION AND MAINTENANCE MANUAL.

MECHANICAL ABBREVIATIONS

- A -	
ABV	ABOVE
A/C	AIR CONDITIONER
AFF	ABOVE FINISH FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AP	ACCESS PANEL
- B -	
BDD	BACKDRAFT DAMPER
BEL	BELOW
BLDG	BUILDING
BTUH	BRITISH THERMAL UNITS PER HOUR
- C -	
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CO	CARBON MONOXIDE
COMP	COMPRESSOR
CONT	CONTINUATION
- D -	
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DI	DIGITAL INPUT
DIA	DIAMETER
DN	DOWN
DO	DIGITAL OUTPUT
DTR	DOWN THRU ROOF
DWD	DOUBLE WALL DUCT
DWG	DRAWING
DX	DIRECT EXPANSION
- E -	
(E)	EXISTING
EA	EXHAUST AIR
EAD	EXHAUST AIR DUCT
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	EXHAUST GRILLE
EMS	ENERGY MANAGEMENT SYSTEM
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
- F -	
FAI	FRESH AIR INTAKE
FLR	FLOOR
FPI	FINS PER INCH
FT	FOOT, FEET
- G -	
GA	GAUGE
GI	GALVANIZED IRON
GPM	GALLONS PER MINUTE
- H -	
HP	HORSEPOWER
HR	HOUR
HVAC	HEATING VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HZ	HERTZ
- I -	
IN.	INCHES
- K -	
KW	KILOWATT
- L -	
(LI)	LINED DUCT
LAT	LEAVING AIR TEMPERATURE
LB	POUND
LWT	LEAVING WATER TEMPERATURE

- M -	
MA	MIXED AIR
MAX	MAXIMUM
MB	MACHINE BOLT
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MS	MOTOR STARTER
MTD	MOUNTED
- N -	
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPS	NOMINAL PIPE SIZE
NTS	NOT TO SCALE
- O -	
OA	OUTSIDE AIR
OC	ON CENTER
ODP	OUTDOOR DRIP PROOF
OPER	OPERATING
OSA	OUTSIDE AIR
- P -	
P.D.	PRESSURE DROP
PH	PHASE
PSI	POUNDS PER SQUARE INCH
- Q -	
QTY	QUANTITY
- R -	
RA	RETURN AIR
RAD	RETURN AIR DUCT
RG	RETURN GRILLE
RL	REFRIGERATION LIQUID
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERATION SUCTION
- S -	
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SENS	SENSIBLE
SF	SUPPLY FAN
SMS	SHEET METAL SCREW
SOV	SHUT OFF VALVE
S.P.	STATIC PRESSURE
SQ	SQUARE
S/S	STAINLESS STEEL
SWR	SIDEWALL RETURN GRILLE
SWS	SIDEWALL SUPPLY GRILLE
SYM	SYMBOL
- T -	
TDH	TOTAL DYNAMIC HEAD
TG	TRANSFER GRILLE
TSTAT	THERMOSTAT
TYP	TYPICAL
- U -	
UNO	UNLESS NOTED OTHERWISE
UTR	UP THRU ROOF
- V -	
VAC	VOLTS ALTERNATING CURRENT
VFD	VARIABLE FREQUENCY DRIVE
- W -	
WT	WEIGHT
W/	WITH

TITLE 24 ACCEPTANCE TESTING

MANDATORY ACCEPTANCE TESTING PER TITLE 24, PART 6 SHALL BE AS FOLLOWS:

AN AABC AGENCY SHALL ACT AS THE ACCEPTANCE AGENT AND PERFORM WORK REQUIRED IN THE FOLLOWING ACCEPTANCE TESTS AS DESCRIBED IN CHAPTER 13 OF THE 2022 NONRESIDENTIAL COMPLIANCE MANUAL. THIS SHALL INCLUDE FILLING OUT, SIGNING, AND SUBMITTING APPLICABLE FORMS LISTED HEREIN.

NRCA-MCH-02-A - OUTDOOR AIR ACCEPTANCE
NRCA-MCH-03-A - CONSTANT VOLUME, SINGLE ZONE, UNITARY AIR CONDITIONER AND HEAT PUMP SYSTEMS.
NRCA-MCH-04-A - AIR DISTRIBUTION SYSTEMS ACCEPTANCE
NRCA-MCH-05-A - AIR ECONOMIZER CONTROLS ACCEPTANCE
NRCA-MCH-06-A - DEMAND CONTROL VENTILATION SYSTEMS ACCEPTANCE
NRCA-MCH-07-A - SUPPLY FAN VFD ACCEPTANCE
NRCA-MCH-11-A - AUTOMATIC DEMAND SHED CONTROL ACCEPTANCE
NRCA-MCH-12-A - FAULT DETECTION & DIAGNOSTICS (FDD) FOR PACKAGED DIRECT EXPANSION UNITS
NRCA-MCH-16-A - SUPPLY AIR TEMPERATURE RESET CONTROLS ACCEPTANCE
NRCA-MCH-18-A - ENERGY MANAGEMENT CONTROL SYSTEM ACCEPTANCE

SPECIFIC REQUIREMENTS AND ACCEPTANCE TESTING FORMS ARE AVAILABLE IN THE 2022 NONRESIDENTIAL COMPLIANCE MANUAL WHICH CAN BE DOWNLOADED FROM www.energy.ca.gov/title24/2022standards/.

MECHANICAL SHEET INDEX

SHEET NO.	DESCRIPTION
M001	MECHANICAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS
M002	MECHANICAL SCHEDULES
M003	MECHANICAL DETAILS
M004	MECHANICAL DETAILS
M200	LOWER LEVEL MECHANICAL DEMOLITION PLAN
M201	MAIN LEVEL MECHANICAL DEMOLITION PLAN
M202	LOWER LEVEL MECHANICAL PLAN
M203	MAIN LEVEL MECHANICAL PLAN
M300	MECHANICAL DEMOLITION ROOF PLAN
M301	MECHANICAL ROOF PLAN
M401	TITLE 24
M402	TITLE 24
M403	TITLE 24
M404	TITLE 24

TOTAL SHEET= 14

MECHANICAL GENERAL NOTES

1. ALL DUCT INSULATION TO HAVE MINIMUM 4.2 INSTALLED R-VALUE.
2. DUCT CONSTRUCTION SHALL BE GALVANIZED STEEL IN ACCORDANCE W/ CHAPTER 6 OF THE C.M.C., SUSPENSION SHALL CONFORM TO 006-2006 SMACNA STANDARDS. SEAL ALL SEAMS AND JOINTS AIR AND WATERTIGHT. FLEXIBLE ALUMINUM DUCT WORK IS NOT ALLOWED, DUCT TAPE IS NOT ALLOWED.
3. FLEXIBLE DUCTWORK & DUCTLINER SHALL HAVE FLAME SPREAD RATING NOT EXCEEDING 25, AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84, NFPA 255 AND U.L. 723.
4. FLEXIBLE DUCTS SHALL CONSIST OF AN EXTERIOR REINFORCED LAMINATED VAPOR BARRIER, 3" FIBERGLASS INSULATION (R-8.0), ENCAPSULATED SPRING STEEL WIRE HELIX AND IMPERVIOUS, SMOOTH, NON-PERFORATED INTERIOR VINYL LINER. INDIVIDUAL LENGTHS OF FLEXIBLE DUCTS SHALL CONTAIN FACTORY FABRICATED STEEL CONNECTION COLLARS.
5. FLEXIBLE DUCTS SHALL BE SUPPORTED AT OR NEAR MID-LENGTH WITH 2" WIDE 28 GA. STEEL HANGER COLLAR ATTACHED TO THE STRUCTURE WITH AN APPROVED DUCT HANGER. INSTALLATION SHALL MINIMIZE SHARP RADIUS TURNS OR OFFSETS. 5' MAXIMUM LENGTH CONNECTING TO TERMINAL INLETS/OUTLETS.
6. PROVIDE BACKDRAFT DAMPERS AT ALL EXHAUST AND FRESH AIR INTAKES.
7. THERMOSTATS SHALL BE AUTOMATIC CHANGEOVER TYPE TO SEQUENCE HEATING AND COOLING. SET POINT RANGE SHALL BE 10 DEG. F BETWEEN FULL HEATING AND FULL COOLING. ADJUSTABLE TEMPERATURE DIFFERENTIAL SHALL BE 1-1/2 DEG. F. THERMOSTAT CONTROL RANGE SHALL BE 55 DEG. F TO 85 DEG. F. CONTROLS SHALL HAVE CAPABILITY OF TERMINATING HEATING AT NO HIGHER THAN 78 DEG. F. AND COOLING AT NO LOWER THAN 70 DEG. F. FANS SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS.
8. LINE VOLTAGE WIRING, LINE VOLTAGE CONDUIT, UNDERGROUND LOW VOLTAGE CONDUIT, DISCONNECT SWITCHES AND LINE VOLTAGE FINAL CONNECTION BY ELECTRICAL CONTRACTOR. LOW VOLTAGE WIRING, ABOVE GROUND LOW VOLTAGE CONDUIT, & LOW VOLTAGE FINAL CONNECTION BY CONTROLS CONTRACTOR.
9. PROVIDE PERMANENT LABEL ON EACH A/C UNIT IDENTIFYING AREA/SPACE SERVED PER CMC 303.6. COORDINATE ROOM NUMBERS WITH OWNER. SEE 230553 FOR ADDITIONAL REQUIREMENTS.
10. SYSTEM AIR BALANCE SHALL BE PERFORMED BY AN INDEPENDENT AGENCY CERTIFIED BY THE AABC. THIS WORK SHALL CONFORM TO CURRENT AABC SPECIFICATIONS AND STANDARDS.
11. PROVIDE WRITTEN WARRANTY TO REPLACE ALL FAULTY MATERIALS AND/OR LABOR, AT NO COST TO OWNER, FOR A PERIOD OF ONE YEAR FROM DATE OF OWNER ACCEPTANCE. PROVIDE 5 YEAR COMPRESSOR WARRANTY AND 10 YEAR HEAT EXCHANGER WARRANTY FOR ALL A/C EQUIPMENT.
12. FOR THE PURPOSE OF CLEARNESS AND LEGIBILITY, THE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND ALTHOUGH SIZES AND LOCATION OF EQUIPMENT IS DRAWN TO SCALE WHEREVER POSSIBLE, THE CONTRACTOR SHALL MAKE USE OF ALL DATA IN ALL OF THE CONTRACTOR DOCUMENTS AND VERIFY THIS INFORMATION BEFORE ORDERING, FABRICATING OR INSTALLING OF ANY MATERIALS.
13. UNLESS SPECIFICALLY SHOWN ON THESE PLANS, NO STRUCTURAL MEMBERS SHALL BE CUT, DRILLED, NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER.
14. ALL DUCT SIZES SHOWN ARE NET INSIDE DIMENSIONS AND DO NOT ACCOUNT FOR DUCT LINER THICKNESS WHERE APPLICABLE. ALL PIPE DIMENSIONS SHOWN ARE NOMINAL SIZES.
15. ALL BRANCH DUCTS SHALL BE PROVIDED WITH ACCESSIBLE MANUAL VOLUME DAMPERS SEE 233300 FOR ADDITIONAL REQUIREMENTS.
16. PROVIDE FLEXIBLE CONNECTIONS TO ALL HVAC EQUIPMENT (A/C UNIT, FANS, ETC.)
17. INSTALLATION & MATERIALS SHALL CONFORM TO THE 2022 EDITION OF THE CALIFORNIA MECHANICAL CODE (CMC) & TITLE 24 PARTS 4 & 6.
18. CONTRACTOR SHALL PROVIDE AS-BUILTS, CAD GENERATED AND DRAWN TO 1/8" = 1'-0" SCALE.. SUBMIT 6 SETS OF HARD COPIES AND 1 ELECTRONIC COPY ON CD-ROM. CAD DRAWINGS SHALL BE AUTOCAD, LATEST VERSION. COORDINATE REQUIREMENTS WITH OWNER.
19. VERIFY FINAL LOCATIONS OF THERMOSTATS AND SENSORS WITH FURNITURE PLANS AND OWNERS REPRESENTATIVE PRIOR TO INSTALLATION.
20. DUCT SYSTEMS USED WITH BLOWER TYPE EQUIPMENT WHICH ARE PORTIONS OF A HEATING, COOLING, ABSORPTION, EVAPORATIVE COOLING, OR OUTDOOR AIR VENTILATION SYSTEM SHALL BE SIZED IN ACCORDANCE WITH CHAPTER 17 OF THE CALIFORNIA MECHANICAL CODE.
21. OPENINGS MADE IN WALLS, FLOORS,OR CEILINGS FOR THE PASSAGE OF DUCTWORK OR PIPE SHALL BE CLOSED AND PROTECTED BY APPROVED METAL COLLARS FASTENED TO THE ADJOINING STRUCTURE.
22. ROOF MOUNTED EQUIPMENT SHALL BE LABELED AS TO THE SPACE IT SERVES.
23. HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH AN APPROVED METHOD PER SECTION 314.1
24. MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX NOT TO EXCEED 25 AND A SMOKE DEVELOPED INDEX NOT TO EXCEED 50, WHERE TESTED AS A COMPOSITE PRODUCT IN ACCORDANCE WITH ASTM E84 OR UL 723.
25. DUCTS, PLENUMS, OR FITTINGS OF METAL SHALL COMPLY WITH SMACNA DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE.
26. JOINTS AND SEAMS FOR DUCT SYSTEMS SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTIONS STANDARDS - METAL AND FLEXIBLE. JOINTS SHALL BE MADE WITH SUBSTANTIALLY AIRTIGHT BY MEANS OF TAPES, MASTICS, GASKETING, OR OTHER MEANS.
27. DUCTWORK SHALL BE LEAK-TESTED IN ACCORDANCE WITH SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL.
28. WHEN FIRE DETECTION OR ALARM SYSTEMS ARE PROVIDED FOR THE BUILDING, ANY REQUIRED SMOKE DETECTORS SHALL BE SUPERVISED BY SUCH SYSTEMS AND SHALL BE CAPABLE OF ACTIVATING THE FIRE ALARM SYSTEM.
29. AT THE TIME OF ROUGH INSTALLATION OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL FINAL STARTUP OF THE HEATING, COOLING AND VENTILATING EQUIPMENT, ALL DUCTS, AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL, OR OTHER ACCEPTABLE METHODS TO REDUCE THE AMOUNT OF DUST, WATER AND DEBRIS WHICH MAY ENTER THE SYSTEM.

3

PIPE AND DUCT SUPPORT NOTES

ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH "MASON" SEISMIC RESTRAINT GUIDELINES FOR SEISMIC RESTRAINT OF MECHANICAL SYSTEMS. OSHPD PRE-APPROVAL # OPM-0043-13.

WHERE ANCHORAGE & BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT, MECHANICAL ENGINEER AND THE INSPECTOR.

A COPY OF THE GUIDELINES PUBLISHED BY "MASON" SHALL BE PROVIDED BY THE CONTRACTOR AND KEPT ON THE JOB SITE AT ALL TIMES.

SEISMIC NOTES

A) THE SEISMIC ANCHORAGE FOR ALL MECHANICAL AND ELECTRICAL EQUIPMENT SHALL BE DESIGNED TO WITHSTAND A LATERAL FORCE:

1. CALCULATED AS SPECIFIED IN SECTION 1616A OF THE VOL. 2, TITLE 24, 2016 CBC.

B) THE CAPACITY OF THE ANCHORAGE CONNECTORS IN SHEAR AND/OR TENSION SHALL BE CLEARLY INDICATED IN THE CALCULATIONS, WHICH INDICATE, ICBO REPORT NO. (IF APPLICABLE) THEIR TOTAL NUMBER, SIZE, GRADE, EMBEDMENT, EDGE DISTANCES, AND OTHER FACTORS WHICH AFFECT THE CAPACITY IN SHEAR AND TENSION.

C) ANCHORAGE DETAILS FOR EQUIPMENT WHICH ARE NOT APPROVED DURING PLAN REVIEW ARE SUBJECT TO APPROVAL BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO INSTALLATION AND INSPECTION BY THE PROJECT INSPECTOR.

SCOPE OF WORK

- REPLACE (E) HVAC EQUIPMENT
- NEW DUCTWORK
- NEW CONTROLS
- TEST AND BALANCE

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
RValera
PUBLIC WORKS
07/02/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
RValera
PUBLIC WORKS
07/02/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — JOSEPH C. GRAY — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MECHANICAL GENERAL NOTES SYMBOLS AND ABBREVIATIONS

SCALE: N/A

DCGR ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

M001

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M001.dwg 6-11-25-4:58 PM

MZ-1 ZONE DAMPER SCHEDULE

ZONE	CFM	DAMPER SIZE
1-1	2250	21 1/2" x 22"
1-2	2000	22 1/2" x 22"
1-3	900	7 1/2" x 22"
1-4	500	7 1/2"x22"
1-5	3450	7 1/2"x22"

MZ-2 ZONE DAMPER SCHEDULE

ZONE	CFM	DAMPER SIZE
2-1	6000	51 1/2"x22"
2-2	1200	15"x22"
2-3	400	7 1/2"x22"
2-4	1500	14"x22"

MZ-3 ZONE DAMPER SCHEDULE

ZONE	CFM	DAMPER SIZE
3-1	1700	-
3-2	4400	-
3-3	1500	-
3-4	450	-
3-5	350	-
3-6	700	-

NOTES:
CONTRACTOR SHALL CONSULT WITH MULTIZONE UNIT FACTORY REPRESENTATIVE TO DETERMINE EXACT ZONE PLENUM/DAMPER SIZES. MAKE ADJUSTMENTS AT UNIT AS REQUIRED FOR AIR VOLUME DELIVERY. INSTALL NEW SIEMENS CONTROLLERS FOR ZONE DAMPERS WITHIN MULTI-ZONE UNITS.

MULTI-ZONE UNIT SCHEDULE

SYM.	MFR./MODEL	AREA SERVED	COOLING (MBH)		SEER / EER	HEATING INPUT/OUTPUT (MBH)	CFM	ESP (INCHES) W.G.	OSA CFM MIN.	ELECTRICAL				POWER EXHAUST ELECTRICAL					SUPPLY FAN HP	OPER. WT. (LBS.)	REMARKS	BLDG. LOCATION	ANCHOR DETAIL REF
			SENSIBLE	TOTAL						FLA	MCA	MOCP	VOLTAGE/PHASE	SYM.	HP	BHP	MCA	VOLTAGE/PHASE					
MZ 1	SEASON 4 SA020	310-315, 317-319, 303,301,321	187.5	253.427	- / 11.4	400/320	9100	0.85	1170	-	113	125	208 / 3	PE 1	1.5	1.17	113	208 / 3		7.5	6000	FOUR STAGE COOLING, DCV, STAINLESS STEEL DRAIN PAN, HOT GAS BYPASS, ENTHALPY SENSOR WITH ECONOMIZER FAULT DETECTION & DIAGNOSTICS, POWER EXHAUST WITH VFD, BACNET MS/TP MODBUS & N2 COMMUNICATION CARD, CONTRACTOR TO INSTALL NEW DUCT DETECTORS ON SUPPLY AND RETURN REFER TO 28 31 11 FOR REQUIREMENTS. UNITS TO SIT ON EXISTING CURBS. RECONNECT TO EXISTING EMS.	ROOF	9 M003
MZ 2	SEASON 4 SA020	305-307, 300,322, 302	187.5	253.427	- / 11.4	400/320	9100	0.85	800	-	113	125	208 / 3	PE 2	1.5	1.17	113	208 / 3		7.5	6000		ROOF	9 M003
MZ 3	SEASON 4 SA020	304,300,200,205 101,103-112	187.5	253.427	- / 11.4	400/320	9100	0.85	2575	-	113	125	208 / 3	PE 3	1.5	1.17	113	208 / 3		7.5	6000		ROOF	9 M003

* OPERATING WEIGHT INCLUDES CURB, ACCESSORIES AND UNIT WEIGHT.
* PROVIDE DUCT SMOKE DETECTOR IN SUPPLY AIR DUCT FOR SHUTDOWN IN ACCORDANCE WITH CMC 608.

AIR CONDITIONING UNIT SCHEDULE

SYM.	MFR./MODEL	AREA SERVED	COOLING (MBH)		SEER / EER	HEATING(MBH)		AFUE %	CFM	EVAPORATOR FAN BHP	ESP (INCHES) W.G.	OSA CFM MIN.	ELECTRICAL			POWER EXHAUST ELECTRICAL					OPER. WT. (LBS.)	REMARKS	BLDG. LOCATION	ANCHOR DETAIL REF
			SENSIBLE	TOTAL		INPUT	OUTPUT						MCA	MOCP	VOLTAGE/PHASE	SYM.	HP	FLA	MCA	VOLTAGE/PHASE				
AC 1	TRANE YHK120	**COMMUNITY 201**	93.24	127.90	- / 11.6	150.0	121.5	80	4000	3	1	1400	60	80	208 / 3	PE 1	2	9.5	11.9	208 / 3		1801	**COMPLETE WITH ISOLATION ROOF CURB, MODULATING POWER EXHAUST, ECONOMIZER, DCV, ULTRA LOW NOX, AND ELECTROMECHANICAL CONTROLS. RECONNECT TO (E)EMS. PROVIDE WITH MERV 13 FILTER.**	ROOF	1 M005

* OPERATING WEIGHT INCLUDES CURB, ACCESSORIES AND UNIT WEIGHT.
* PROVIDE DUCT SMOKE DETECTOR IN SUPPLY AIR DUCT FOR SHUTDOWN IN ACCORDANCE WITH CMC 608.

EXHAUST FAN SCHEDULE

SYM.	MFR./MODEL	TYPE	CFM	ESP (INCHES) W.G.	RPM	SONES	ELECTRICAL			OPER. WT. (LBS.)	REMARKS	BLDG. LOCATION	ANCHORAGE DETAIL
							WATT	HP	VOLTAGE/PHASE				
EF 1	**GREENHECK G-095**	**ROOF**	**630**	**0.50**	**1725**	**9.3**	-	**1/6**	115 / 1	**55**	PROVIDE W/ ROOF CURB, BIRDSCREEN, BACK DRAFT DAMPER. INTERLOCK WITH (E) EMS.	RESTROOM LOWER LVL + MAIN LVL	2 M003
EF 2	**GREENHECK SP-A50-90-VG**	**CEILING**	**70**	**0.25**	**838**	**0.9**	**6**	-	115 / 1	**15**	PROVIDE W/ ROOF CURB, CAP W/ BIRDSCREEN, BACK DRAFT DAMPER. INTERLOCK WITH LIGHT SWITCH.	STAFF RESTROOM	6 M004
EF 3	**GREENHECK SP-A50-90-VG**	**CEILING**	**70**	**0.25**	**838**	**0.9**	**6**	-	115 / 1	**15**	PROVIDE W/ ROOF CURB, CAP W/BIRDSCREEN, BACK DRAFT DAMPER. INTERLOCK WITH LIGHT SWITCH.	FAMILY RESTROOM	6 M004
EF 4	**GREENHECK SP-A390-VG**	**CEILING**	**150**	**0.25**	**920**	**2**	**18**	-	115 / 1	**25**	PROVIDE W/ ROOF CURB, CAP W/ BIRDSCREEN, BACK DRAFT DAMPER. INTERLOCK WITH LIGHT SWITCH.	BREAKROOM	6 M004
EF 5	**GREENHECK SP-A390-VG**	**CEILING**	**150**	**0.25**	**920**	**2**	**18**	-	115 / 1	**25**	PROVIDE W/ ROOF CURB, CAP W/ BIRDSCREEN, BACK DRAFT DAMPER. INTERLOCK WITH AC-1.	KITCHEN	6 M004

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

SYM.	MFR./MODEL	AREA SERVED	COOLING		ELECTRICAL		OPER. WT. (LBS)	REMARKS	SYM.	MFR./MODEL	CFM	ELECTRICAL		OSA	OPER. WT. (LBS)	REMARKS	DETAILS
			MBH	SEER	MCA	VOLTAGE/PHASE						MCA	VOLTAGE/PHASE				
CU 1	MITSUBISHI TRUZA024	MDF 316A	24	21.4	19	208 / 1	180		FC 1	MITSUBISHI TPKA0A024	700	1	208 / 1	-	55	MOUNTED ON PLATFORM. INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT WITH UNIT POWERED CONDENSATE PUMP. WALL MOUNTED THERMOSTAT.	7 M003
CU 2	MITSUBISHI TRUZA024	ELEVATOR CONTROL 102	24	21.4	19	208 / 1	180		FC 2	MITSUBISHI TPKA0A024	700	1	208 / 1	-	55	MOUNTED ON PLATFORM. INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT WITH UNIT POWERED CONDENSATE PUMP. WALL MOUNTED THERMOSTAT.	7 M003

AIR DISTRIBUTION SCHEDULE

SYM.	CFM	MAX. P.D. INCHES	MAX. NC	NECK SIZE	MFR./MODEL	REMARKS
CD-1	50-200	0.10	30	6"	PRICE SPD	SQUARE PLAQUE DIFFUSER, STEEL CONSTRUCTION, WHITE POWDER COAT FINISH.
	201-350	0.10	30	8"		
	351-500	0.10	30	10"		
	501-700	0.10	30	12"		
	701-900	0.10	30	14"		
	901-1,000	0.10	30	15"		
RG-1/ EG-1/ TG-1	50-250	0.10	30	8"x8"	PRICE SERIES 500	LOUVERED FACE, 3/4" BLADE SPACING, STEEL CONSTRUCTION, WHITE POWDER COAT FINISH. 35° DEFLECTION UNLESS NOTED ON PLANS.
	251-375	0.10	30	10"x10"		
	376-550	0.10	30	12"x12"		
	551-700	0.10	30	14"x14"		
	701-950	0.10	30	16"x16"		
	951-1400	0.10	30	18"x18"		
	1401-1750	0.10	30	20"x20"		
SWS-1/ SWR-1/ SWE-1	SEE PLANS	0.10	30	**SEE PLANS**	PRICE SERIES 500	LOUVERED FACE, 3/4" BLADE SPACING, STEEL CONSTRUCTION, WHITE POWDER COAT FINISH. 35° DEFLECTION UNLESS NOTED ON PLANS.
RD-1	SEE PLANS	0.10	30	**SEE PLANS**	PRICE RCD	ROUND CONE DIFFUSER, STEEL CONSTRUCTION WHITE POWDER COAT FINISH.
SDGR-1	SEE PLANS	0.10	30	**SEE PLANS**	PRICE SDGER	SPIRAL DUCT GRILLE, ALUMINUM CONSTRUCTION WHITE POWDER COAT FINISH.
LD-1	SEE PLANS	0.10	30	**SEE PLANS**	PRICE -	FOR WOOD CEILING. COORDINATE FINAL COLOR SELECTIONS WITH ARCHITECT.

NOTE:
- CEILING DIFFUSER THROWS SHALL BE 4-WAY UNLESS OTHERWISE NOTED.
- PROVIDE REMOTE MOTOR OPERATED DAMPER AT HARD CEILINGS AND LOCATIONS WHERE DAMPER IS LOCATED ABOVE ARCHITECTURAL CLOUDS.
- ALL AIR DISTRIBUTION DEVICES TO HAVE CONCEALED MOUNTING OPTION.
- FOR 1, 2, OR 3-WAY PATTERN, INSTALL QUADRANT BLANKS.
- PROVIDE FILLER PANEL FOR AIR DISTRIBUTION INSTALLED IN LAY-IN CEILINGS.

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
RValera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
RValera
PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

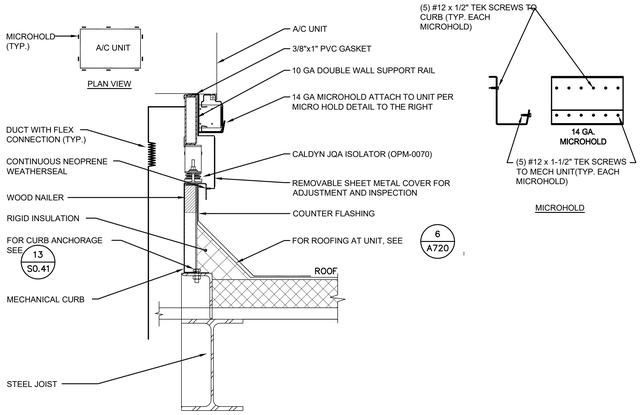
MECHANICAL SCHEDULES

SCALE: NTS: 1'-0"

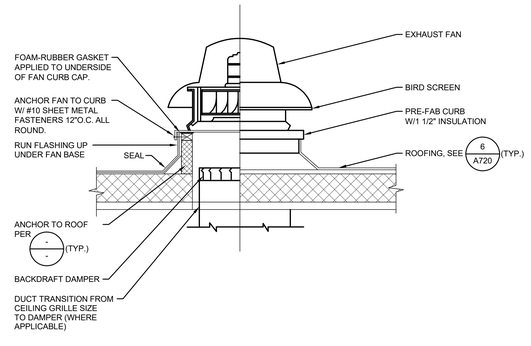
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

M002

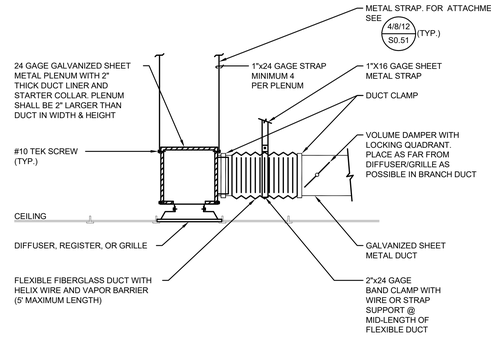
R: \Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M002.dwg 6-11-25-4:58 PM



AC MOUNTING ON ROOF DETAIL (PACKAGED UNIT) | SCALE NONE | 1



EXHAUST FAN MOUNTING DETAIL | SCALE NONE | 2



AIR DISTRIBUTION DETAIL DETAIL | SCALE NONE | 3

ROUND DUCT VOLUME DAMPER DETAIL | SCALE NONE | 4

EXPOSED DUCT SUPPORT DETAIL | SCALE NONE | 5

CONCEALED DUCT SUPPORT DETAIL | SCALE NONE | 6

WALL MOUNTED FAN COIL DETAIL | SCALE NONE | 7

SPLIT SYSTEM CONTROL WIRING DIAGRAM | SCALE NONE | 8

AC MOUNTING ON EXISTING CURB DETAIL (MULTIZONE) | SCALE NONE | 9

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
Carlos A. Gomez, Mike Perez, Eric A. Chan, Paul Nguyen, Jon Hall

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE TITLE 29
R.Valera
PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER G. MAAS No. M38752 MECHANICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

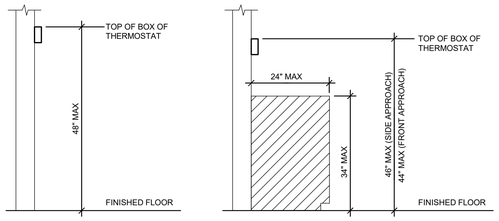
MECHANICAL DETAILS

SCALE: N/A'S: 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

M003

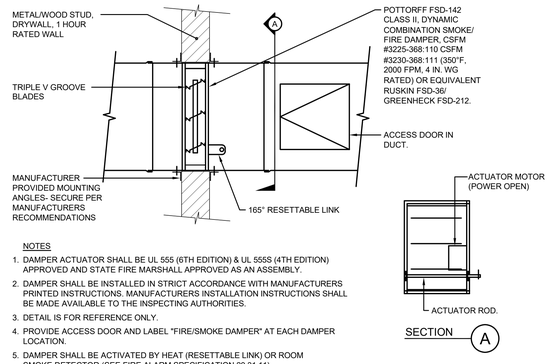
R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M003.dwg 6-11-25-4:58 PM



NOTE:
FORWARD OR FRONT APPROACH FOR DEVICES MOUNTED ABOVE COUNTERS ASSUMES THAT DIRECTLY BELOW THE DEVICE, THE COUNTER HAS A 30" MIN. WIDTH x 27" MIN. HIGH x 19" MIN. DEEP CLEAR OPENING.

THERMOSTAT/CO2 SENSOR MOUNTING DETAIL

SCALE: NONE | 1

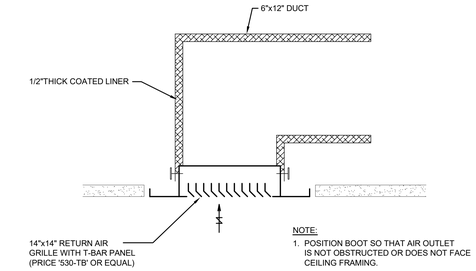


NOTES

1. DAMPER ACTUATOR SHALL BE UL 555 (6TH EDITION) & UL 555S (4TH EDITION) APPROVED AND STATE FIRE MARSHALL APPROVED AS AN ASSEMBLY.
2. DAMPER SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS PRINTED INSTRUCTIONS. MANUFACTURERS INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITIES.
3. DETAIL IS FOR REFERENCE ONLY.
4. PROVIDE ACCESS DOOR AND LABEL "FIRE/SMOKE DAMPER" AT EACH DAMPER LOCATION.
5. DAMPER SHALL BE ACTIVATED BY HEAT (RESETTABLE LINK) OR ROOM SMOKE DETECTOR (SEE FIRE ALARM SPECIFICATION 28 31 11)
6. ACTIVATION OF CSFD SHALL SHUT DOWN RELATED HVAC UNIT PER CMC 605.8.

COMBINATION SMOKE/FIRE DAMPER DETAIL

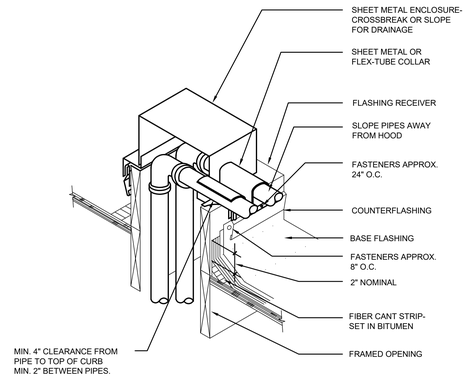
SCALE: NONE | 2



NOTE:
1. POSITION BOOT SO THAT AIR OUTLET IS NOT OBSTRUCTED OR DOES NOT FACE CEILING FRAMING.

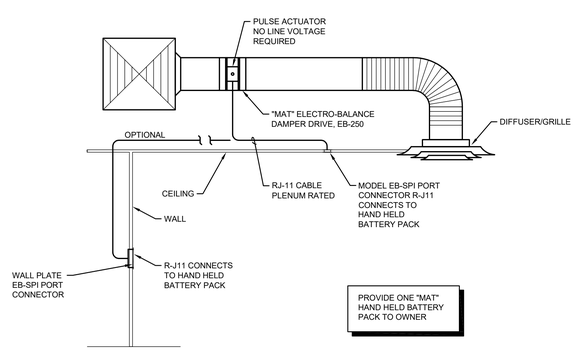
RELIEF GRILLE DETAIL

SCALE: NONE | 3



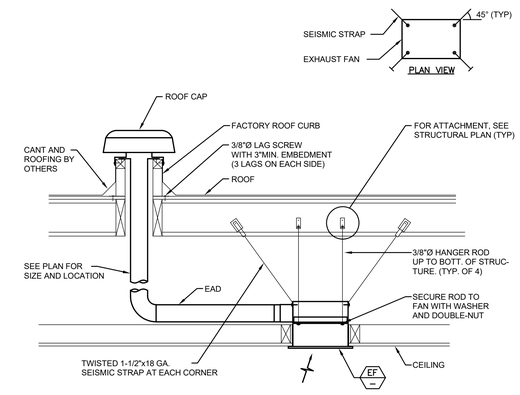
REFRIGERANT PIPING THRU ROOF DETAIL

SCALE: NONE | 4



REMOTE OPERATED DAMPER DETAIL

SCALE: NONE | 5



CEILING MOUNTED EXHAUST FAN DETAIL

SCALE: NONE | 6

SCALE: NONE | 7

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4745 E. Ontario Mills Pkwy
Ontario, Ca. 91764
909.980.7222
Fax 909.980.7223

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or deviations to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE TITLE 29
R.Valera
PUBLIC WORKS
07/02/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or deviations to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
WEIHSHER G. MA
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

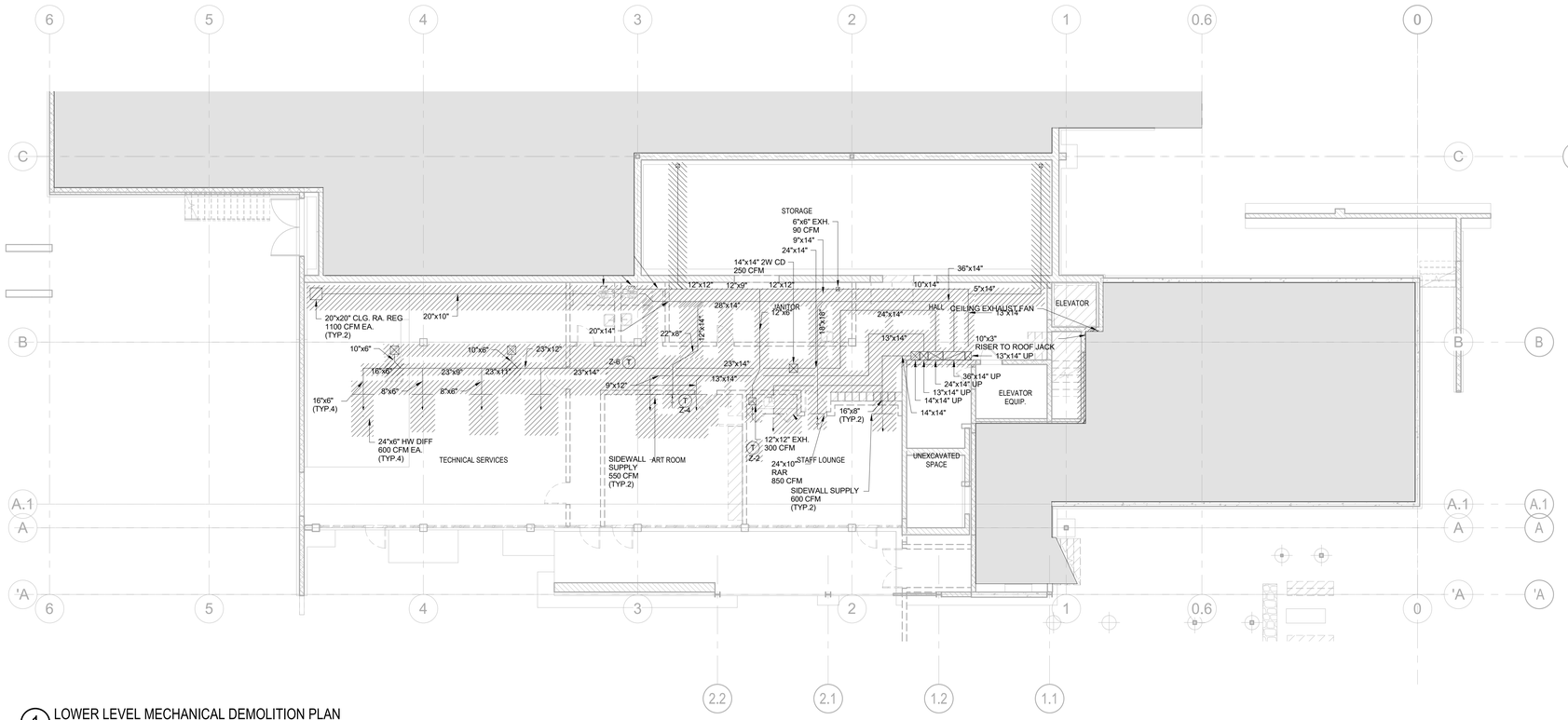
MECHANICAL DETAILS AND PIPING DIAGRAM

SCALE: NTS 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

M004

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M004.dwg 6-11-25-4:58 PM



1 LOWER LEVEL MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

6/11/2025 5:02:40 PM

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
R.Valera
PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

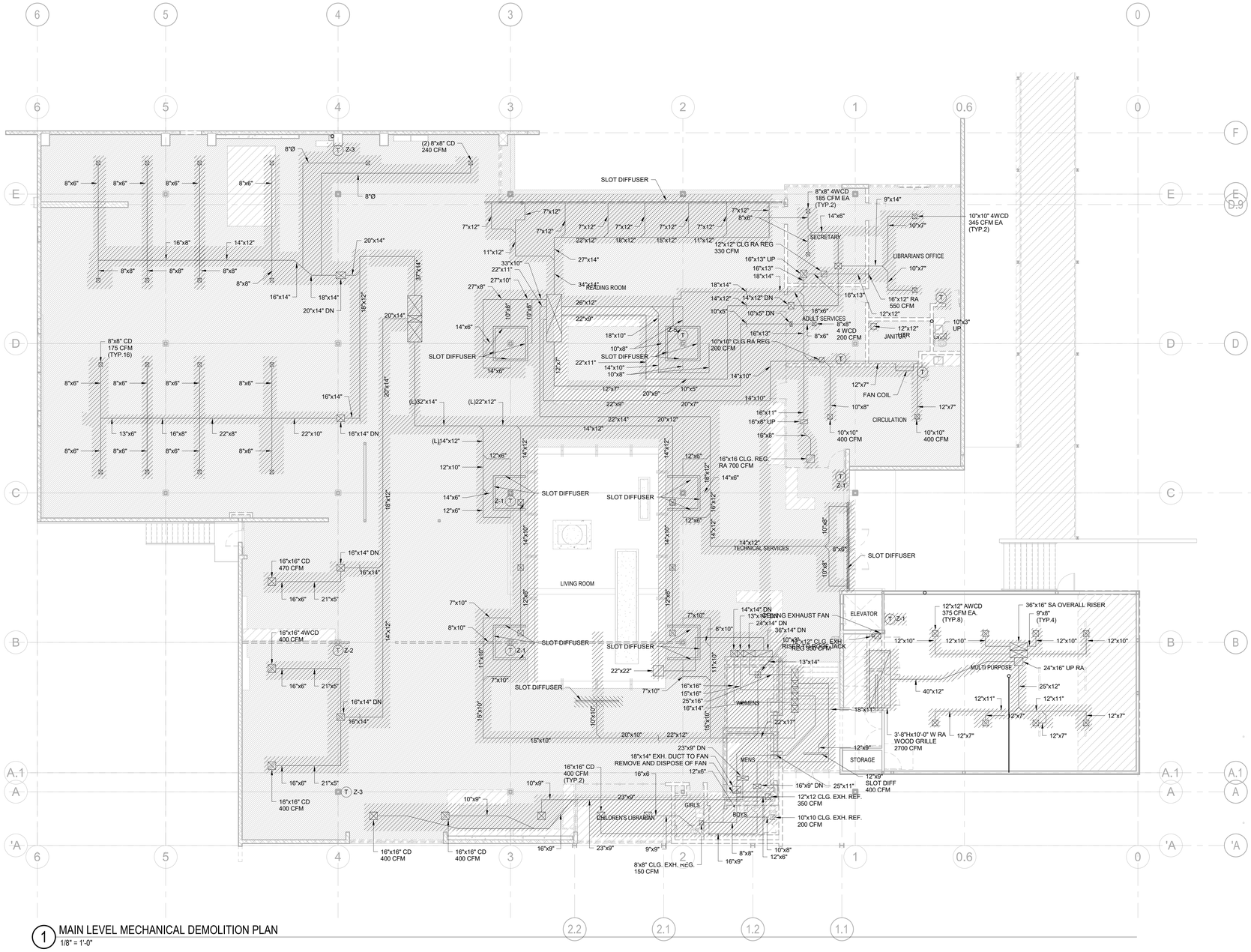
LOWER LEVEL MECHANICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

M200

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax.909.980.7023



1 MAIN LEVEL MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

6/11/2025 5:02:43 PM

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.286.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CGR TITLE 24, PART 1,
ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
R.Valera
PUBLIC WORKS
07/02/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER G. MAY
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

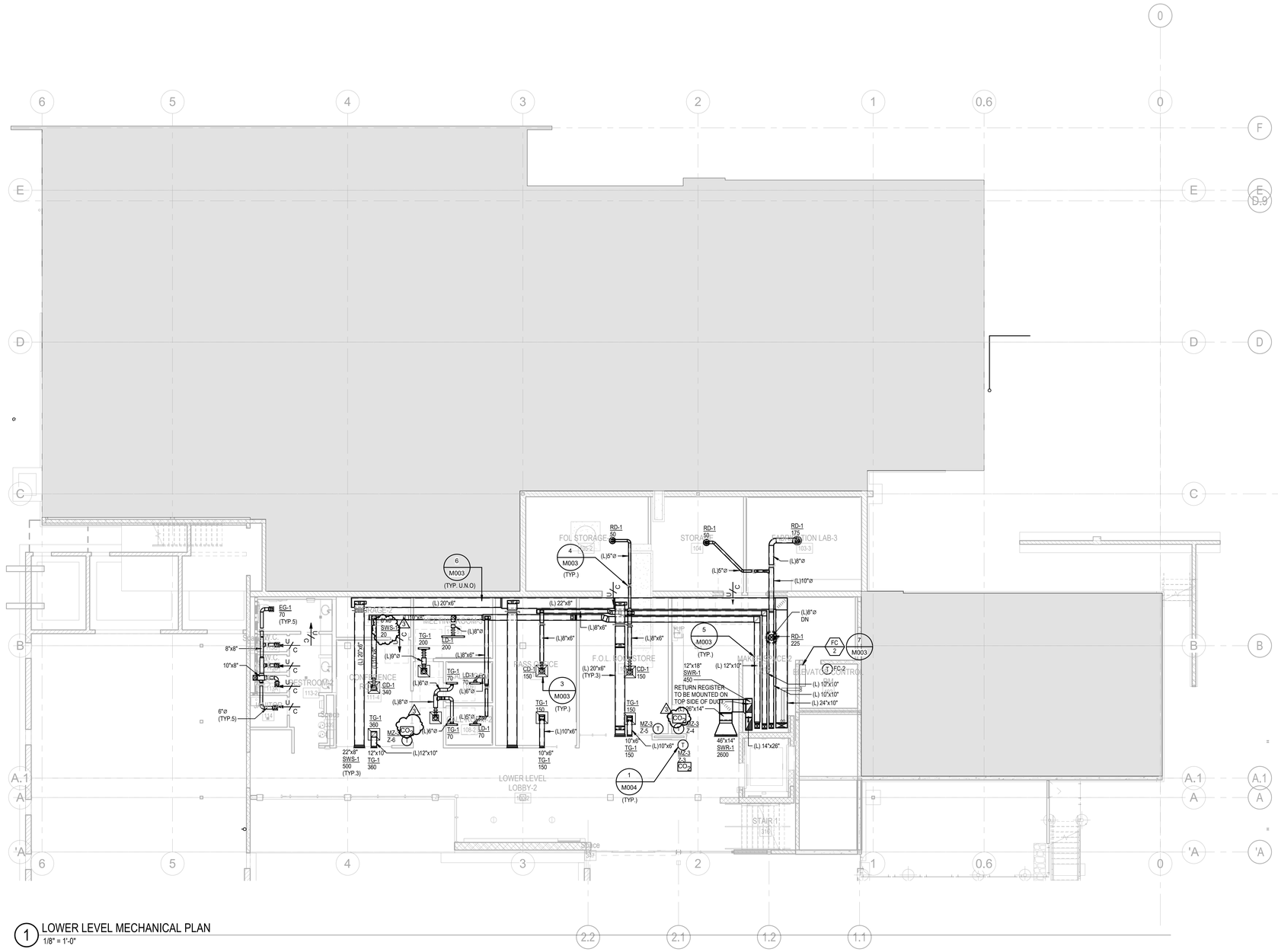
MAIN LEVEL MECHANICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

M201

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023



1 LOWER LEVEL MECHANICAL PLAN
1/8" = 1'-0"

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
R.Valera
PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER G. MAY
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

LOWER LEVEL MECHANICAL PLAN

SCALE: 1/8" = 1'-0"

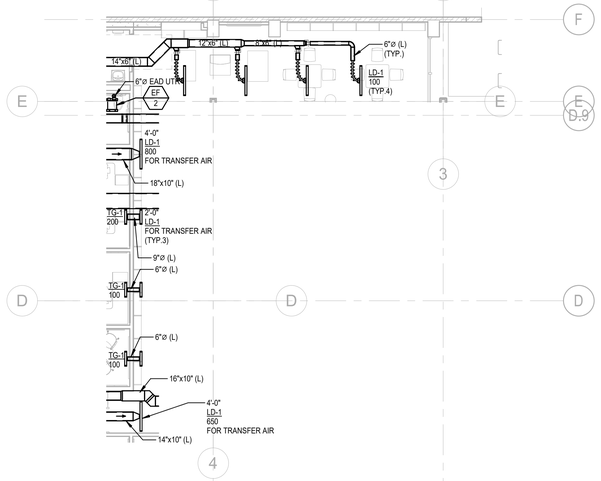
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.5017
Fax.909.980.7023

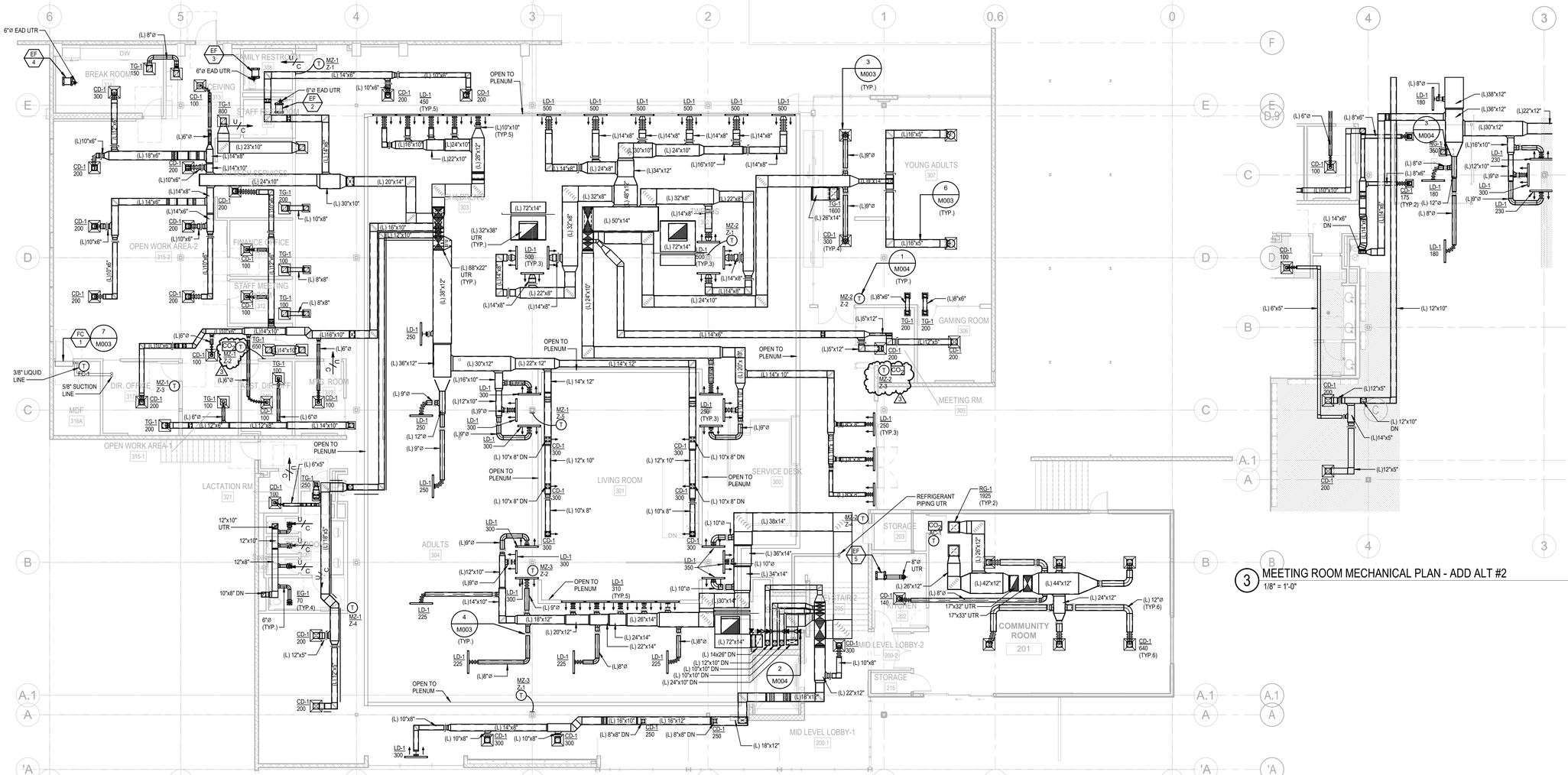
M202

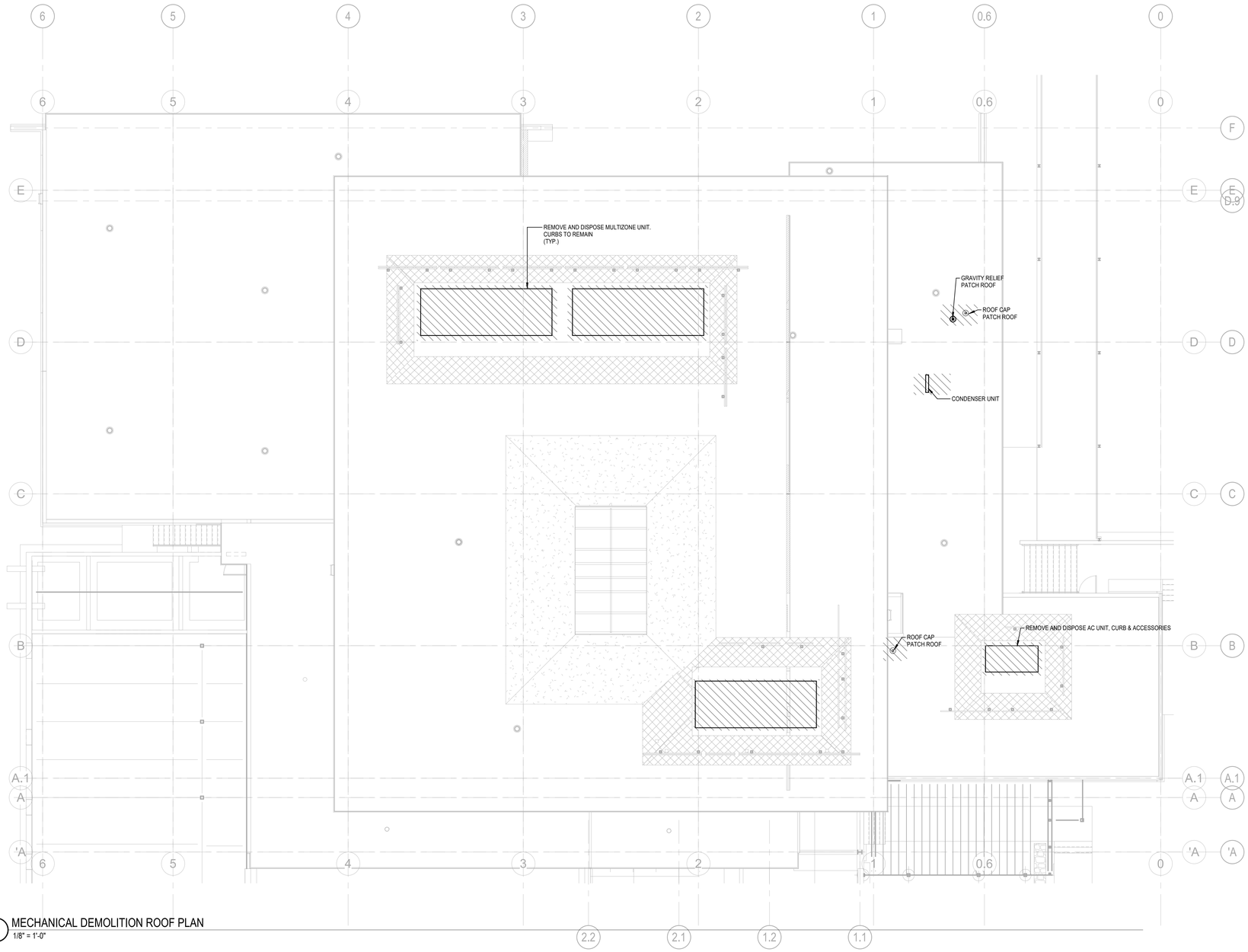
6/11/2025 5:02:46 PM

SHEET NOTES



2 CHILDRENS AREA MECHANICAL PLAN - ADD ALT #3
1/8" = 1'-0"


6"ø EAD UTR
EF 4
(L) 8"ø
TG-1 150
BREAK ROOM 310
CD-1 300
CD-1 100
TG-1 800
RECEIVING 312
STAFF RESTROOM
EF 3
6"ø EAD UTR
EF 2
MZ-1 Z-1
(L) 14"x6"
(L) 10"x6"
CD-1 200
LD-1 450 (TYP.5)
OPEN TO PLENUM
LD-1 500
(L)10"x10" (TYP.5)
(L)16"x10"
(L)24"x10"
(L)22"x10"
(L)26"x12"
(L) 23"x10"
(L) 18"x6"
(L)14"x10"
(L)10"x6"
(L) 24"x10"
(L) 20"x14"
(L) 30"x10"
(L) 32"x8"
(L) 32"x6"
(L)22"x8"
(L) 72"x14"
(L) 50"x14"
(L) 32"x38" UTR (TYP.)
(L) 88"x22" UTR (TYP.)
(L) 38"x12"
(L) 24"x8"
(L) 48"x12"
(L) 72"x14"
LD-1 600 (TYP.3)
MZ-2 Z-1
LD-1 500 (TYP.3)
(L) 24"x10"
(L) 34"x12"
(L) 16"x10"
(L) 14"x8"
(L) 22"x8"
(L) 14"x6"
(L) 22"x8"
(L) 14"x8"
(L) 24"x8"
(L) 32"x8"
(L) 22"x8"
(L) 14"x8"
(L) 14"x8"
(L) 14



1 MECHANICAL DEMOLITION ROOF PLAN
1/8" = 1'-0"

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1,
ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
R.Valera
PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
WILLIAM F. GOMA
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MECHANICAL DEMOLITION ROOF PLAN

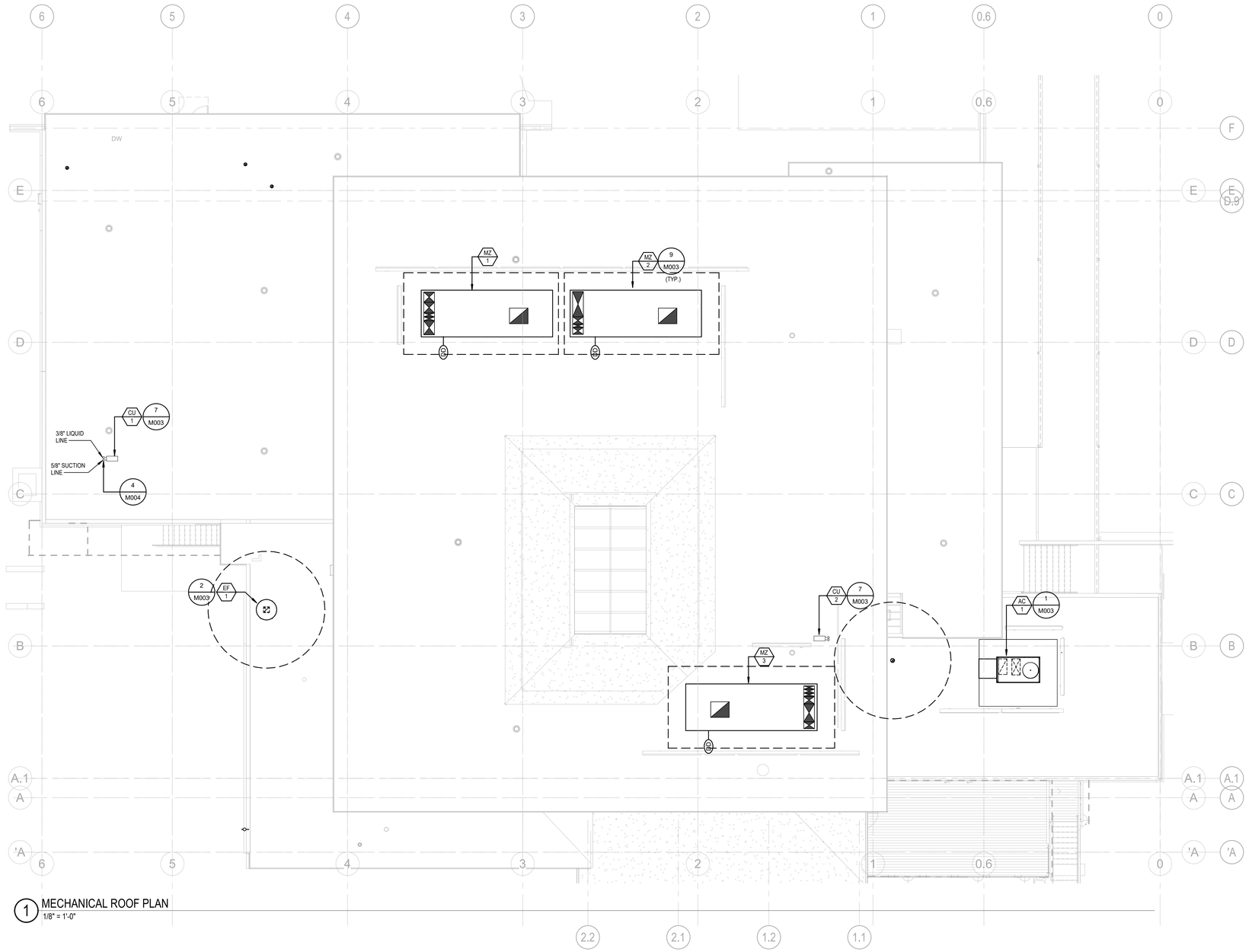
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

M300

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4700 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

6/11/2025 5:02:58 PM



1 MECHANICAL ROOF PLAN
1/8" = 1'-0"

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1, ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
R.Valera
PUBLIC WORKS
07/02/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3		

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MECHANICAL ROOF PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

M301

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

6/11/2025 5:03:02 PM

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, or 141.0(b)2 for alterations.	
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 1 of 32)
Project Address: 600 E Mariposa St.	**Date Prepared:** 5/7/2025

A. GENERAL INFORMATION

01	Project Location (city)	Altadena	04	Total Conditioned Floor Area	20352
02	Climate Zone	9	05	Total Unconditioned Floor Area	89
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1

● Classroom ● Commercial Industrial ● Office ● Support Areas ● All Other Occupancies

B. PROJECT SCOPE

This table Includes mechanical systems or components that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, 170.2(b) or 141.0(b)2 and 180.2(b)2 for alterations.

01	02	03
Air System(s)	Wet System Components	Dry System Components
☒ Heating Air System	☐ Water Economizer	☒ Air Economizer
☒ Cooling Air System	☐ Pumps	☐ Electric Resistance Heat
Mechanical Controls	☐ System Piping	☒ Fan Systems
☒ Mechanical Controls (existing to remain, altered or new)	☐ Cooling Towers	☒ Ductwork (existing to remain, altered or new)
	☐ Chillers	☒ Ventilation
	☐ Boilers	☐ Zonal Systems/ Terminal Boxes

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 2 of 32)
	Date Prepared: 5/7/2025

C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with mechanical requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D., or the table indicated as not compliant for guidance.

01		02		03		04		05		06		07		08	09
System Summary 110.1, 110.2, 140.4, 170.2(c)	AND	Pumps 140.4(k), 170.2(c)4I	AND	Fans/ Economizers 140.4(c), 140.4(e), 170.2(c)	AND	System Controls 110.2, 120.2, 140.4(f), 170.2(c)	AND	Ventilation 120.1, 160.2	AND	Terminal Box Controls 140.4(d), 170.2(c)4B	AND	Distribution 120.3, 140.4(l), 160.2, 160.3	AND	Cooling Towers 110.2(e)2	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
Yes	AND		AND	Yes	AND	Yes	AND	Yes	AND		AND	Yes	AND		COMPLIES
Mandatory Measures Compliance (See Table Q for Details)										COMPLIES					

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Space Conditioning System Information

01	02	03	04	05	06
System Name	Quantity	System Serving	System Status	Space Type	Utilizing Recovered Heat
MZ-1	1	Single zone	New/ Addition		☐
MZ-2	1	Single zone	New/ Addition		☐
MZ-3	1	Single zone	New/ Addition		☐
AC-1	1	Single zone	New/ Addition		☐

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 3 of 32)
	Date Prepared: 5/7/2025

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Space Conditioning System Information

01	02	03	04	05	06
System Name	Quantity	System Serving	System Status	Space Type	Utilizing Recovered Heat
FC-1	1	Single zone	New/ Addition		☐
FC-2	1	Single zone	New/ Addition		☐

Dry System Equipment Sizing (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters and DOAS systems)

01	02	03	04	05	06	07	08	09	10	11
Name or Item Tag	Equipment Category per Tables 110.2, 140.4(a)2 and 170.2(c)3aii	Equipment Type per Tables 110.2 and Title 20	Smallest Size Available[1] 140.4(a) and 170.2(c)1	Equipment Sizing per Mechanical Schedule (kBtu/h) 140.4(a&b), 170.2(c)1 & 170.2(c)2						
				Heating Output[2,3]			Cooling Output[2,3]		Load Calculations[3,4]	
				Per Design (kBtu/h)	Rated (kBtu/h)	Supp. Heating Output (kBtu/h)	Sensible Per Design (kBtu/h)	Rated (kBtu/h)	Total Heating Load (kBtu/h)	Total Sensible Cooling Load (kBtu/h)
MZ-1	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Load Controls	320	320	0	213.18	187.5	103.44	238.83
MZ-2	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Load Controls	320	320	0	200.91	187.5	69.68	246.54
MZ-3	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Load Controls	320	320	0	227.03	187.5	213.39	378.4
AC-1	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Load Controls	121.5	121.5	0	101.13	93.24	96.03	153.94
FC-1	Unitary AC/ Condensers	AC, air cooled, split (3 phase)	NA: Load Controls	0	0	0	22.61	24	1.69	29.71
FC-2	Unitary AC/ Condensers	AC, air cooled, split (3 phase)	NA: Load Controls	0	0	0	24.93	24	-0.42	26.08

[1]FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per 140.4(a) and 170.2(c)1. Healthcare facilities are excepted.
[2]It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 4 of 32)
	Date Prepared: 5/7/2025

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Dry System Equipment Sizing (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters and DOAS systems)

01	02	03	04	05	06	07	08	09	10	11

[3] If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.
[4] Authority Having Jurisdiction may ask for load calculations used for compliance per 140.4(b) and 170.2(c).

Dry System Equipment Efficiency (other than Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP), DX-DOAS and Dual Fuel Heat Pumps)

01	02	03	04	05	06	07	08	09
		Heating Mode				Cooling Mode		
Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Minimum Efficiency Required per Tables 110.2 / Title 20	Design Efficiency	Efficiency Unit	Minimum Efficiency Required per Tables 110.2 / Title 20	Design Efficiency
MZ-1	>=240,000		Combustion Efficiency	0.8	0.81	EER IEER	9.8 13	9.5 12.9
MZ-2	>=240,000		Combustion Efficiency	0.8	0.81	EER IEER	9.8 13	9.5 12.9
MZ-3	>=240,000		Combustion Efficiency	0.8	0.81	EER IEER	9.8 13	9.5 12.9
AC-1	>=65,000 and <135,000		AFUE	0.8	0.8	EER IEER	11.0 14.6	11.6 12.9
FC-1	<65,000					SEER2	14.3	21.4
FC-2	<65,000					SEER2	14.3	21.4

G. PUMPS

This section does not apply to this project.

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 5 of 32)
	Date Prepared: 5/7/2025

H. FAN SYSTEMS & AIR ECONOMIZERS

This table is used to demonstrate compliance with prescriptive requirements found in 140.4(c), 140.4(e), 140.4(m), 170.2(c)3, and 170.2(c)4A for fan systems. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.

System Name	MZ-1	Quantity	1	Fan System Status	New	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	9,100	Site Elevation	1,200	Economizer	Differential Temperature
01	02	03	04			05		06	07	08	09			10	11
Fan Name or Item Tag	Fan Type	Qty	Component			Airflow through Component (%)		Water Gauge (w.g)	Allowance		Design				
									Component Allowance	Fan Allowance (watt/cfm)[3]	Design Electrical Input Power Method			Motor Nameplate Horsepower	Design Electrical Input Power (kW)
SF	Supply	1	Base Allowance for system serving spaces <=6 floors away			9,100			2330		Manufacturer provided				6.29
			MERV 13-16 Filter downstream of thermal conditioning equipment			9,100			1793						
			Gas heat			9,100			546						
			Hydronic/DX cooling coil or heat pump coil			9,100			1092						
			Economizer Return Damper			9,100			364						
RF	Return	1	Exhaust System Base Allowance			8,100			1490		Manufacturer provided				1.04
Supply Fan Base Allowance (kW)			Exhaust/Return/Relief/Transfer Fan Base Allowance(kW)						Fan System Allowance (kW)[3]		7.61		Fan System Electrical Output (kW)		7.33

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 6 of 32)
	Date Prepared: 5/7/2025

H. FAN SYSTEMS & AIR ECONOMIZERS

System Name	MZ-2	Quantity	1	Fan System Status	New	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	9,100	Site Elevation	1,200	Economizer	Differential Temperature
01	02	03	04			05		06	07	08	09			10	11
Fan Name or Item Tag	Fan Type	Qty	Component			Airflow through Component (%)		Water Gauge (w.g)	Allowance		Design				
									Component Allowance	Fan Allowance (watt/cfm)[3]	Design Electrical Input Power Method			Motor Nameplate Horsepower	Design Electrical Input Power (kW)
SF	Supply	1	Base Allowance for system serving spaces <=6 floors away			9,100			2330		Manufacturer provided				6.29
			MERV 13-16 Filter downstream of thermal conditioning equipment			9,100			1793						
			Gas heat			9,100			546						
			Hydronic/DX cooling coil or heat pump coil			9,100			1092						
			Economizer Return Damper			9,100			364						
RF	Return	1	Exhaust System Base Allowance			8,100			1490		Manufacturer provided				1.04
Supply Fan Base Allowance (kW)			Exhaust/Return/Relief/Transfer Fan Base Allowance(kW)						Fan System Allowance (kW)[3]		7.61		Fan System Electrical Output (kW)		7.33

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 7 of 32)
	Date Prepared: 5/7/2025

H. FAN SYSTEMS & AIR ECONOMIZERS

System Name	MZ-3	Quantity	1	Fan System Status	New	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	9,100	Site Elevation	1,200	Economizer	Differential Temperature
01	02	03	04			05		06	07	08	09			10	11
Fan Name or Item Tag	Fan Type	Qty	Component			Airflow through Component (%)		Water Gauge (w.g)	Allowance		Design				
									Component Allowance	Fan Allowance (watt/cfm)[3]	Design Electrical Input Power Method			Motor Nameplate Horsepower	Design Electrical Input Power (kW)
SF	Supply	1	Base Allowance for system serving spaces <=6 floors away			9,100			2330		Manufacturer provided				6.29
			MERV 13-16 Filter downstream of thermal conditioning equipment			9,100			1793						
			Gas heat			9,100			546						
			Hydronic/DX cooling coil or heat pump coil			9,100			1092						
			Economizer Return Damper			9,100			364						
RF	Return	1	Exhaust System Base Allowance			8,100			1490		Manufacturer provided				1.04
Supply Fan Base Allowance (kW)			Exhaust/Return/Relief/Transfer Fan Base Allowance(kW)						Fan System Allowance (kW)[3]		7.61		Fan System Electrical Output (kW)		7.33

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 8 of 32)
	Date Prepared: 5/7/2025

H. FAN SYSTEMS & AIR ECONOMIZERS

System Name	AC-1	Quantity	1	Fan System Status	New	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	4,000	Site Elevation	1,200	Economizer	Fixed Temperature
01	02	03	04			05		06	07	08	09			10	11
Fan Name or Item Tag	Fan Type	Qty	Component			Airflow through Component (%)		Water Gauge (w.g)	Allowance		Design				
									Component Allowance	Fan Allowance (watt/cfm)[3]	Design Electrical Input Power Method			Motor Nameplate Horsepower	Design Electrical Input Power (kW)
SF	Supply	1	Base Allowance for system serving spaces <=6 floors away			4,000			928		Manufacturer provided				2.5
			MERV 13-16 Filter downstream of thermal conditioning equipment			4,000			924						
			Gas heat			4,000			232						
			Hydronic/DX cooling coil or heat pump coil			4,000			556						
			Economizer Return Damper			4,000			184						
Supply Fan Base Allowance (kW)			Exhaust/Return/Relief/Transfer Fan Base Allowance(kW)						Fan System Allowance (kW)[3]		2.82		Fan System Electrical Output (kW)		2.5

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: Altadena Libraries Renovation	**Report Page:** (Page 9 of 32)
	Date Prepared: 5/7/2025

H. FAN SYSTEMS & AIR ECONOMIZERS

System Name	FC-1	Quantity	1	Fan System Status	New	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	700	Site Elevation	1,200	Economizer	NA: <=33 kBtu/h cooling
01	02	03	04			05		06	07	08	09			10	11
Fan Name or Item Tag	Fan Type	Qty	Component			Airflow through Component (%)		Water Gauge (w.g)	Allowance		Design				
									Component Allowance	Fan Allowance (watt/cfm)[3]	Design Electrical Input Power Method			Motor Nameplate Horsepower	Design Electrical Input Power (kW)
SF	Supply	1	Base Allowance for system serving spaces <=6 floors away			700			162		Manufacturer provided				0.09
			MERV 13-16 Filter upstream of thermal conditioning equipment			700			97						
			Hydronic/DX cooling coil or heat pump coil			700			97						
Supply Fan Base Allowance (kW)			Exhaust/Return/Relief/Transfer Fan Base Allowance(kW)						Fan System Allowance (kW)[3]		1		Fan System Electrical Output (kW)		0.09

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1,
ARTICLE 1 & PART 6
RValera
PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
RValera
PUBLIC WORKS
07/09/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER G. DCGA
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	TITLE 24

SCALE: NTS: 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax 909.980.7323

M401

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M401.dwg 6-11-25-4:58 PM

H. FAN SYSTEMS & AIR ECONOMIZERS

System Name	FC-2	Quantity	1	Fan System Status	New	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	700	Site Elevation	1,200	Economizer	NA: <=33 kBtu/h cooling
01	02	03	04			05		06	07	08	09			10	11

						Allowance		Design			
Fan Name or Item Tag	Fan Type	Qty	Component	Airflow through Component (%)	Water Gauge (w.g)	Component Allowance	Fan Allowance (watt/cfm)[3]	Design Electrical Input Power Method	Motor Nameplate Horsepower	Design Electrical Input Power (kW)
SF	Supply	1	Base Allowance for system serving spaces <=6 floors away	700		162		Manufacturer provided		0.09
			MERV 13-16 Filter upstream of thermal conditioning equipment	700		97				
			Hydronic/DX cooling coil or heat pump coil	700		97				
Supply Fan Base Allowance (kW)			Exhuast/Return/Relief/Transfer Fan Base Allowance(kW)			Fan System Allowance (kW)[3]		1	Fan System Electrical Output (kW)	0.09

[1] *FOOTNOTES: Fans serving spaces with design background noise goals below NC35*
[2] *Low-turndown single-zone VAV fan system must be capable of and configured to reduce airflow to 50 percent of design airflow and use no more than 30 percent of the design wattage at that airflow. No more than 10 percent of the design load served by the equipment shall have fixed loads.*
[3] *Fan system allowance includes fan system base allowance.*
[4] *Filter pressure loss can only be counted once per fan system.*
[5] *Complex Fan System means a fan system that combines a single cabinet fan system with other supply fans, exhaust fans, or both.*
[6] *Computer room economizers must meet requirements of 140.9(a) and will be documented on the NRCC-PRC-E document..*

H. EXHAUST AIR HEAT RECOVERY 140.4(q), 170.2(c)4O

01	02	03	04	05	06	07	08	09	10	11

H. EXHAUST AIR HEAT RECOVERY 140.4(q), 170.2(c)4O

Fan System Name	Qty	Hours of Operation per Year	Design Supply Airflow Rate	Outdoor Airflow	% Outdoor Air at Full Design Airflow	Exemptions to Exhaust Air Heat Recovery Requirement per 140.4(q) & 170.2(c)4O	Exhaust Air Heat Recovery 140.4(q) & 170.2(c)4O	Type Of Heat Recovery Rating	Required Recovery Ratio	Energy Recovery Bypass

Fan Energy Index (FEI)

01	02	03
Name or Item Tag	FEI Exception	FEI

I. SYSTEM CONTROLS

This table is used to demonstrate compliance with mandatory controls in 110.2 and 120.2 and prescriptive controls in 140.4(f) and (n), 170.2(c)4D 170.2(c)4L or requirements in 141.0(b)2E 180.2(b)2 for altered space conditioning systems.

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft²)	Thermostats 110.2(b) & (c)[1], 120.2(a) 160.3(a)2A or 141.0(b)2E & 180.2(b)2	Shut-Off Controls 120.2(e) & 160.3(a)2D	Isolation Zone Controls 120.2(g) & 160.3(a)2F	Demand Response 110.12 120.2(b) & 160.3(a)2B	Supply Air Temp. Reset 140.4(f) & 170.2(c)4D	Window Interlocks per 140.4(n) & 170.2(c)4D
MZ-1	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use	Provided
MZ-2	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use	Provided
MZ-3	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use	Provided
AC-1	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use	Provided

I. SYSTEM CONTROLS

FC-1	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use / Provided
FC-2	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use / Provided
Unconditioned	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	4 Hour Timer	EMCS	NA: Would increase energy use / Provided

[1] *FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats.*

J. VENTILATION AND INDOOR AIR QUALITY

This table is used to demonstrate compliance with mandatory ventilation requirements in 120.1 120.2(e)3B 140.4(p) and 140.4(q) for all nonresidential and hotel/motel and d:t24refnolink/1160.2, 160.3(a)3D, 170.2(a)4N, 170.2(a)4O for high-rise residential occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflows may be shown on the plans or the calculations can be presented in a spreadsheet.

01	☐	Check the box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.
02	☒	Check this box if the project included Nonresidential, Hotel/Motel Spaces or Multifamily Common Use Spaces
03	☐	Check the box if the project is using natural ventilation in any nonresidential or hotel/motel spaces to meet required ventilation rates per 120.1(c)2.

Nonresidential and Hotel/ Motel Multifamily Common Use Ventilation Systems

04	05			06			07
System Name	MZ-1	System Design OA CFM Airflow[1]	1610	System Design Transfer Air CFM	0		Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2] / Provided
08	09	10	11	12	13	14	15	16

J. VENTILATION AND INDOOR AIR QUALITY

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)3[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3[6] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
Childrens 303	Library - reading room/ stacks	1855		33	278.2	0	280	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Break Room 314	Break room	205		7	102.5	0	150	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
IT/Tech Services 310	Office space	170		1	25.5	0	30	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Finance Office 311	Office space	102		1	15.3	0	20	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Open Work Area-1 315-1	Reception area	126		1	18.9	0	20	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Open Work Area-2 315-2	Reception area	1218		8	182.7	0	205	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type

J. VENTILATION AND INDOOR AIR QUALITY

Dir.Office 317	Office space	163		1	24.4	0	25	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Asst.Dir. Off. 318	Office space	108		1	16.2	0	20	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Living Room 301	Library - reading room/ stacks	881		18	132.2	0	135	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Lactation 321	All others	48			7.2	0	10	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Family Restroom 308	Toilet, public	56	1		0	70	70	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Staff Restroom 309	Toilet, private	62	1		0	50	70	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Restroom 320	Toilet, public	228	4		0	280	280	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type

J. VENTILATION AND INDOOR AIR QUALITY

Staff Meeting Room 312	Conference/ meeting	80		5	40	0	40	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Receiving 313	All others	168		0	0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Adults 304 Interior	Library - reading room/ stacks	857.5		16	128.6	0	130	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Adults 304 Exterior Southwest	Library - reading room/ stacks	444		8	66.6	0	70	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Mtg.Room 319	Conference/ meeting	104		7	52	0	55	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				1090	18	Ventilation for this System Complies?		Yes

04	05			06			07
System Name	MZ-2	System Design OA CFM Airflow[1]	1052	System Design Transfer Air CFM	0		Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2] / Provided
08	09	10	11	12	13	14	15	16

J. VENTILATION AND INDOOR AIR QUALITY

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)3[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3[6] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
Young Adults 307	All others	1075		20	161.2	0	165	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Service Desk 300	Office space	685		13	102.8	0	105	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Gaming Room 306	All others	164		11	24.6	0	85	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Tweens 302	Library - reading room/ stacks	2335		42	350.2	0	355	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Meeting Room 305	All others	119		18	17.8	0	60	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				657	18	Ventilation for this System Complies?		Yes

04	05			06			07
System Name	MZ-3	System Design OA CFM Airflow[1]	3224	System Design Transfer Air CFM	0		Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2] / Provided
08	09	10	11	12	13	14	15	16

J. VENTILATION AND INDOOR AIR QUALITY

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)3[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3[6] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
Adults 304 interior South	Library - reading room/ stacks	857.5		16	128.6	0	130	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Adults 304 exterior South	Library - reading room/ stacks	1741		31	261.2	0	265	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Fabrication Lab-3 103-3	All others	321		16	48.2	0	120	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Storage 104	All others	258		1	38.7	0	40	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Makerspace-2 101-2	All others	611		31	91.6	0	235	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
FOL Storage-2 105-2	Library - reading room/ stacks	339		7	50.8	0	55	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type

J. VENTILATION AND INDOOR AIR QUALITY

F.O.L Bookstore 106	Library - reading room/ stacks	360		8	54	0	60	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Pass. Office 107	Office space	353		2	53	0	55	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Lower level Lobby-2 100-2	Lobbies	1251		179	625.5	0	1345	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Conference Room-4 111-4	Conference/ meeting	234		16	117	0	120	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Meeting Room-5 110-5	Conference/ meeting	144		10	72	0	75	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Restrooms-2 113-2	Toilet, public	226	4		0	280	280	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Janitor 114	Janitor closet	34			0	34	70	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CCR TITLE 24, PART 1,
ARTICLE 1 & PART 6
ReValera PUBLIC WORKS
07/09/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
ReValera PUBLIC WORKS
07/09/2025 8:51:53 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER G. MAS No. M38752 MECHANICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024
SHEET TITLE:	

TITLE 24

SCALE: NTS: 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGR ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax 909.980.7323

M402

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M402.dwg 6-11-25-4:58 PM

J. VENTILATION AND INDOOR AIR QUALITY

Call Room 109	Office space	56		4	8.4	0	30	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Call Room-2 108-2	Office space	54		4	8.1	0	30	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Mid Level Lobby-1 200-1	All others	450		0	0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
Mid-Level Lobby-2 200-2	All others	49		0	0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
(E) Stair 2 205	All others	90		0	0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				1557	18	Ventilation for this System Complies?		Yes

04		05			06			07	
System Name	AC-1	System Design OA CFM Airflow[1]		1531	System Design Transfer Air CFM		0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]	
								Provided	
08	09	10	11	12	13	14	15	16	

K. TERMINAL BOX CONTROLS

This section does not apply to this project.

L. DISTRIBUTION (DUCTWORK and PIPING)

This table is used to show compliance with mandatory pipe insulation requirements found in 120.3 and mandatory requirements found in 120.4(g) for duct sealing.

01	☐	Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service. Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall have a Class I or Class II vapor retarder. All penetrations and joints of which shall be sealed.

Duct Leakage Testing

The answers to the questions below apply to the following duct systems:	MZ-1	**NR/ Common Use:** Duct leakage testing shall not exceed 6% per NA7.5.3 required for these systems?	No

J. VENTILATION AND INDOOR AIR QUALITY

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)[3] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
Community Room 201	Assembly- multiuse	1289		184	644.5	0	1380	DCV	Provided per §120.1(d)4
								Occ Sensor	NA: Not required space type
Kitchen 202	Kitchenettes	119		1	0	35.7	150	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				644	18	Ventilation for this System Complies?		Yes

04		05			06			07	
System Name	FC-1	System Design OA CFM Airflow[1]		15	System Design Transfer Air CFM		0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]	
								Provided	
08	09	10	11	12	13	14	15	16	

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)[3] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
MDF 316A	All others	101			0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				0	18	Ventilation for this System Complies?		Yes

L. DISTRIBUTION (DUCTWORK and PIPING)

			Dwelling Units: Total duct leakage of duct system shall not exceed 12% or duct system to outside shall not exceed 6% per RA3.1.4 required for systems?	No
			Duct leakage testing per CMC Section 603.10.1 required for these systems?	Yes
11	No	The scope of the project includes only duct systems serving healthcare facilities		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	No	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	Yes	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:		
15		The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17		All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A		
18		All ductwork is an extension of an existing duct system		
19		Ductwork serving individual dwelling unit		
20		< 25 ft of new or replacement space conditioning ducts installed		
21	R-4.2	Duct Insulation R-value		
22				
23				
The answers to the questions below apply to the following duct systems:		MZ-2	**NR/ Common Use:** Duct leakage testing shall not exceed 6% per NA7.5.3 required for these systems?	Yes

J. VENTILATION AND INDOOR AIR QUALITY

04		05			06			07	
System Name	FC-2	System Design OA CFM Airflow[1]		0	System Design Transfer Air CFM		0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]	
								Provided	
08	09	10	11	12	13	14	15	16	

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)[3] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
Elevator Control RM 102	All others	80			0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				0	18	Ventilation for this System Complies?		Yes

04		05			06			07	
System Name	Unconditioned	System Design OA CFM Airflow[1]		0	System Design Transfer Air CFM		0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]	
								Provided	
08	09	10	11	12	13	14	15	16	

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)[3] 160.2(c)5D 160.2(c)5E 160.2(c)5D		
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM		
Storage 215	All others	25		0	0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type

L. DISTRIBUTION (DUCTWORK and PIPING)

			Dwelling Units: Total duct leakage of duct system shall not exceed 12% or duct system to outside shall not exceed 6% per RA3.1.4 required for systems?	No
			Duct leakage testing per CMC Section 603.10.1 required for these systems?	No
11	No	The scope of the project includes only duct systems serving healthcare facilities		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	Yes	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:		
15		The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17		All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A		
18		All ductwork is an extension of an existing duct system		
19		Ductwork serving individual dwelling unit		
20		< 25 ft of new or replacement space conditioning ducts installed		
21	R-4.2	Duct Insulation R-value		
22				
23				
The answers to the questions below apply to the following duct systems:		MZ-3	**NR/ Common Use:** Duct leakage testing shall not exceed 6% per NA7.5.3 required for these systems?	No

J. VENTILATION AND INDOOR AIR QUALITY

Storage 203	All others	56		0	0	0	0	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				0	18	Ventilation for this System Complies?		Yes

[1] *FOOTNOTES: System CFM should include both mechanical and natural ventilation for the zone/system*

[2] *Air filtration requirements apply to the following three system types per 120.1(c)1A: space conditioning systems utilizing ducts to supply air to occupiable space; supply-only ventilation systems providing outside air to occupiable space; supply side of balanced ventilation systems including heat recovery and energy recovery ventilation systems providing outside air to occupiable space.*

[3] *Uniform Mechanical Code may have more stringent ventilation requirements; the most stringent code requirement takes precedence.*

[4] *See Standards Tables 120.1-A and 120.1-B.*

[5] *For lecture halls with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code.*

[6] *120.2(e)3 requires systems serving rooms that are required by 130.1(c) to have lighting occupancy sensing controls to also have occupancy sensing zone controls for ventilation. Examples of spaces which require lighting occupancy sensors include offices 250ft² or smaller, multipurpose rooms less than 1,000 ft², classrooms, conference rooms, restrooms, aisles and open areas in warehouses, library book stack aisles, corridors, stairwells, parking garages, and loading and unloading zones, unless excepted by 130.1(c).*

K. TERMINAL BOX CONTROLS

This section does not apply to this project.

L. DISTRIBUTION (DUCTWORK and PIPING)

			Dwelling Units: Total duct leakage of duct system shall not exceed 12% or duct system to outside shall not exceed 6% per RA3.1.4 required for systems?	No
			Duct leakage testing per CMC Section 603.10.1 required for these systems?	Yes
11	No	The scope of the project includes only duct systems serving healthcare facilities		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	No	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	Yes	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:		
15		The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17		All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A		
18		All ductwork is an extension of an existing duct system		
19		Ductwork serving individual dwelling unit		
20		< 25 ft of new or replacement space conditioning ducts installed		
21	R-4.2	Duct Insulation R-value		
22				
23				
The answers to the questions below apply to the following duct systems:		MZ-1	**NR/ Common Use:** Duct leakage testing shall not exceed 6% per NA7.5.3 required for these systems?	No

L. DISTRIBUTION (DUCTWORK and PIPING)

			Dwelling Units: Total duct leakage of duct system shall not exceed 12% or duct system to outside shall not exceed 6% per RA3.1.4 required for systems?	No
			Duct leakage testing per CMC Section 603.10.1 required for these systems?	No
11	No	The scope of the project includes only duct systems serving healthcare facilities		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	Yes	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:		
15		The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17		All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A		
18		All ductwork is an extension of an existing duct system		
19		Ductwork serving individual dwelling unit		
20		< 25 ft of new or replacement space conditioning ducts installed		
21	R-8	Duct Insulation R-value		
22				
23				
The answers to the questions below apply to the following duct systems:		FC-1	**NR/ Common Use:** Duct leakage testing shall not exceed 6% per NA7.5.3 required for these systems?	No

L. DISTRIBUTION (DUCTWORK and PIPING)

			Dwelling Units: Total duct leakage of duct system shall not exceed 12% or duct system to outside shall not exceed 6% per RA3.1.4 required for systems?	No
			Duct leakage testing per CMC Section 603.10.1 required for these systems?	No
11	No	The scope of the project includes only duct systems serving healthcare facilities		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	No	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:		
15		The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17		All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A		
18		All ductwork is an extension of an existing duct system		
19		Ductwork serving individual dwelling unit		
20		< 25 ft of new or replacement space conditioning ducts installed		
21	R-8	Duct Insulation R-value		
22				
23				
The answers to the questions below apply to the following duct systems:		FC-2	**NR/ Common Use:** Duct leakage testing shall not exceed 6% per NA7.5.3 required for these systems?	No

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING AND SAFETY DIVISION
Department of Public Works
FINAL ENERGY APPROVED
UNDER CBC TITLE 24, PART 1, ARTICLE 1 & PART 6
R.Valera
PUBLIC WORKS
07/02/2025 8:51:25 AM
This set of plans and specifications must be kept at the job site at all times, and is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 29
R.Valera
PUBLIC WORKS
07/02/2025 8:51:33 AM
This set of plans and specifications must be kept at the job site at all times, and it is unlawful to make any changes, modifications or additions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — JAMES C. MAS — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

TITLE 24

SCALE: N/A

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGR ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7323

M403

R: \Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\M\21085M403.dwg 6-11-25- 4:59 PM

PLUMBING SYMBOLS

RPBFP	REDUCED PRESSURE BACKFLOW PREVENTER (RPBFP)
	FLOOR DRAIN, AREA DRAIN
	ROOF DRAIN, OVERFLOW DRAIN
	FLOOR SINK
	REDUCER
	UNION
	FLEXIBLE CONNECTOR
	STRAINER
	WATER HAMMER ARRESTER BEHIND ACCESS PANEL
	TRAP PRIMER BEHIND ACCESS PANEL
	PRESSURE GAUGE WITH PET COCK
	THERMOMETER
	TEMPERATURE/PRESSURE RELIEF VALVE & PRESSURE RELIEF VALVE
	AIR RELIEF VALVE
	VACUUM RELIEF VALVE
	CHECK VALVE
	SHUT-OFF VALVE
	VALVE ON RISER
	BALANCING VALVE
	VALVE IN YARD BOX
	SOLENOID VALVE (ELECTRIC)
	GAS COCK
	HOSE BIBB
	DIRECTION OF FLOW
	PLUGGED OUTLET
	PIPING BREAK
	FLOOR CLEANOUT
	FLOOR CLEANOUT IN YARDBOX
	CLEANOUT (CO)
	PIPING RISE OR DROP
	PIPING DOWN
	PIPING UP
	BRANCH CONNECTION
	BRANCH-BOTTOM CONNECTION

	DRAINAGE ABOVE GROUND
	DRAINAGE BELOW GROUND
	SANITARY VENT
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER RETURN
G	NATURAL GAS (LOW PRESSURE)
MPG	NATURAL GAS (MEDIUM PRESSURE)
SD	STORM DRAINAGE ABOVE GROUND
SD	STORM DRAINAGE BELOW GROUND
OD	OVERFLOW DRAIN ABOVE GROUND
CD	CONDENSATE DRAIN
	(E) DRAINAGE BELOW GROUND
	(E) SANITARY VENT
	(E) DOMESTIC COLD WATER
	(E) DOMESTIC HOT WATER
	(E) DOMESTIC HOT WATER RETURN
(E)G	(E) NATURAL GAS (LOW PRESSURE)
(E)CD	(E) CONDENSATE DRAIN
(E)SD	(E) STORM DRAINAGE
(E)OD	(E) OVERFLOW DRAINAGE
	EXISTING TO BE REMOVED
	EXISTING FIXTURE TO BE REMOVED
	SEWER CONNECTION W/ "Y" FITTING @ EXISTING AND NEW PIPE
	POINT OF DEMOLITION
	POINT OF CONNECTION
DETAIL NUMBER / M-X / DRAWING NUMBER	DETAIL DESIGNATION
EQUIPMENT DESCRIPTION / NUMBER EQUIPMENT	EQUIPMENT DESIGNATION

ADA COMPLIANCE NOTES

1. COVER EXPOSED HOT & COLD WATER PIPING AND WASTE PIPING AT ALL LAVATORIES WITH NEATLY PRE-FORMED PIPE INSULATION, PLUMBEREX "PRO-EXTREME MODEL X4333 OR X4444 OR APPROVED EQUIVALENT. COMPLY ASME A112.18.9
2. ALL PIPING UNDER LAVATORIES SHALL BE INSULATED OR OTHERWISE COVERED. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER LAVATORIES.
3. FAUCET CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST.
4. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THE 5 lbf. LEVER-OPERATED, PUSH TYPE AND ELECTRONICALLY CONTROLLED MECHANISMS ARE EXAMPLES OF ACCEPTABLE DESIGNS. SELF-CLOSING VALVES ARE ALLOWED IF THE FAUCET REMAINS OPEN FOR AT LEAST 10 SECONDS.
5. ACCESSIBLE PLUMBING FIXTURES SHALL COMPLY WITH ALL OF THE REQUIREMENTS OF CBC 2019-CHAPTER 11B-DIVISION 6. HEIGHTS AND LOCATION OF ALL FIXTURES SHALL BE ACCORDING TO CBC TABLE 11B-604.9. FIXTURE CONTROLS SHALL COMPLY WITH CHAPTER SECTION 11B-309.4.

MATERIAL SCHEDULE

A. BELOW GRADE WASTE, VENT, AND STORM DRAIN PIPING SHALL BE NO-HUB CAST IRON SOIL PIPE AND FITTINGS. HUB JOINTS PROHIBITED (BELL & SPIGOT).

B. ABOVE GRADE WASTE, VENT, AND STORM DRAIN PIPING SHALL BE NO-HUB CAST IRON SOIL PIPE AND FITTINGS.

C. ABOVE GRADE WATER AND CONDENSATE DRAIN PIPING SHALL BE TYPE "L" HARD DRAWN COPPER WATER TUBE WITH WROUGHT COPPER SOLDER JOINT FITTINGS.

D. BELOW GRADE WATER AND CONDENSATE DRAIN PIPING SHALL BE TYPE "K" HARD DRAWN COPPER WATER TUBE WITH WROUGHT COPPER SOLDER JOINT FITTINGS.

F. A/C CONDENSATE - TYPE "L" COPPER PIPE AND FITTINGS.

PLUMBING ABBREVIATIONS

- A -
ABV ABOVE
AC AIR CONDITIONING (HVAC)
ACC ACCESSIBLE
AFF ABOVE FINISH FLOOR
AFSR AUTOMATIC FIRE SPRINKLER RISER
AP ACCESS PANEL
AV ACID VENT
AW ACID WASTE
- B -
BEH BEHIND
BEL BELOW
BTUH BRITISH THERMAL UNITS PER HOUR
- C -
CD CONDENSATE DRAIN
CFH CUBIC FEET PER HOUR
CFM CUBIC FEET PER MINUTE
CLG CEILING
CO CLEANOUT
CONT CONTINUATION
COTG CLEANOUT TO GRADE
CU FT CUBIC FEET
CW COLD WATER (DOMESTIC)
- D -
DN DOWN
DPX DUPLEX
DR DROP
DS DOWN SPOUT
DWG DRAWING
- E -
(E) EXISTING
EL ELEVATION
EQUIP EQUIPMENT
ESEW EMERGENCY SHOWER EYE WASH
EWC ELECTRIC WATER COOLER
- F -
F FIRE LINE
FCO FLOOR CLEANOUT
FD FLOOR DRAIN
FFE FINISHED FLOOR ELEVATION
FLR FLOOR
FT FOOT, FEET
FU FIXTURE UNIT
FV FLUSH VALVE
- G -
G GAS (LOW PRESSURE)
GAL GALLON
GC GAS COCK
GPF GALLONS PER FLUSH
GPH GALLONS PER HOUR
GPM GALLONS PER MINUTE
GPR GAS PRESSURE REGULATOR
GWH GAS WATER HEATER
GW GREASE WASTE
- H -
HB HOSE BIBB
HP HORSEPOWER
HW HOT WATER (DOMESTIC)
HWR HOT WATER RETURN (DOMESTIC)
- I -
ICW INDUSTRIAL COLD WATER
IW INDIRECT WASTE
IE INVERT ELEVATION
INT INTEGRAL
- K -
KW KILOWATT
- L -
LAV LAVATORY
- M -
MPG MEDIUM PRESSURE GAS
MTD MOUNTED
- N -
NTS NOT TO SCALE
NC NORMALLY CLOSED
NO NORMALLY OPEN
- O -
OC ON CENTER
OD OVERFLOW DRAIN
- P -
PH PHASE
PO PLUGGED OUTLET
POC POINT OF CONNECTION
PSI POUNDS PER SQUARE INCH
- Q -
QTY QUANTITY
- R -
RD ROOF DRAIN
RI ROUGH-IN
RPM REVOLUTIONS PER MINUTE
- S -
SAN SANITARY SEWER
SD STORM DRAIN
SK SINK
SOV SHUT-OFF VALVE
- T -
TMV THERMOSTATIC MIXING VALVE
TP TRAP PRIMER
TPL TRAP PRIMER LINE
TYP TYPICAL
TW TEMPERED WATER
TWR TEMPERED WATER RETURN
- U -
UR URINAL
- V -
V VENT
VERT VERTICAL
VTR VENT THROUGH ROOF
VB VACUUM BREAKER
- W -
W WASTE
W/ WITH
WC WATER CLOSET
WCO WALL CLEANOUT
WH WALL HYDRANT
WHA WATER HAMMER ARRESTOR
- Y -
YB YARD BOX

PIPE AND DUCT SUPPORT NOTES

ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH "MASON" SEISMIC RESTRAINT GUIDELINES FOR SEISMIC RESTRAINT OF MECHANICAL SYSTEMS. OSHPD PRE-APPROVAL # OPM-0043-13.

WHERE ANCHORAGE & BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT, MECHANICAL ENGINEER AND THE INSPECTOR.

A COPY OF THE GUIDELINES PUBLISHED BY "MASON" SHALL BE PROVIDED BY THE CONTRACTOR AND KEPT ON THE JOB SITE AT ALL TIMES.

SEISMIC NOTES

A) THE SEISMIC ANCHORAGE FOR ALL MECHANICAL AND ELECTRICAL EQUIPMENT SHALL BE DESIGNED TO WITHSTAND A LATERAL FORCE:
   1. CALCULATED AS SPECIFIED IN SECTION 1613A OF THE VOL. 2, TITLE 24, 2019 CBC.

B) THE CAPACITY OF THE ANCHORAGE CONNECTORS IN SHEAR AND/OR TENSION SHALL BE CLEARLY INDICATED IN THE CALCULATIONS, WHICH INDICATE, ICBO REPORT NO. (IF APPLICABLE) THEIR TOTAL NUMBER, SIZE, GRADE, EMBEDMENT, EDGE DISTANCES, AND OTHER FACTORS WHICH AFFECT THE CAPACITY IN SHEAR AND TENSION.

C) ANCHORAGE DETAILS FOR EQUIPMENT WHICH ARE NOT APPROVED DURING PLAN REVIEW ARE SUBJECT TO APPROVAL BY THE STRUCTURAL ENGINEER OF RECORD AND PRIOR TO INSTALLATION AND INSPECTION BY THE PROJECT INSPECTOR.

PLUMBING SHEET INDEX

SHEET NO.	DESCRIPTION
P001	PLUMBING GENERAL NOTES, ABBREVIATIONS & SYMBOLS
P002	PLUMBING SCHEDULES AND DETAILS
P003	PLUMBING DETAILS
P111	PLUMBING SITE PLAN
P200	LOWER LEVEL PLUMBING DEMOLITION PLAN
P201	MAIN LEVEL PLUMBING DEMOLITION PLAN
P202	LOWER LEVEL SEWER/VENT PLAN
P203	LOWER LEVEL HOT/COLD WATER PLAN
P204	MAIN LEVEL SEWER/VENT PLAN
P205	MAIN LEVEL HOT/COLD WATER PLAN
P206	MAIN LEVEL STORM DRAIN PLAN
P207	MAIN LEVEL GAS PLAN
P300	PLUMBING DEMOLITION ROOF PLAN
P301	PLUMBING ROOF PLAN
P400	PLUMBING RISER DIAGRAMS

TOTAL SHEET= 15

GENERAL NOTES

1. EXISTING CONDITIONS ARE SHOWN BASED ON AVAILABLE RECORD DRAWINGS AND VISUAL FIELD WALKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUCTING THEIR OWN JOB WALK TO FAMILIARIZE THEM SELVES WITH THE EXISTING CONDITIONS AND BY SUBMITTING A BID ACCEPTS CONDITIONS UNDER WHICH THE CONTRACTOR WILL BE REQUIRED TO PERFORM/COMPLETE THE WORK.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2022 CALIFORNIA PLUMBING CODES, CALIFORNIA STATE FIRE MARSHAL, CALIFORNIA OFFICE OF THE STATE ARCHITECT, AND CALIFORNIA ADMINISTRATIVE CODES, TITLES 17, 24 AND AUTHORITIES HAVING JURISDICTIONS.
3. CONTRACTOR SHALL VERIFY ALL UTILITIES LOCATION, SIZE AND ELEVATIONS WITH CIVIL ENGINEER'S DRAWINGS PRIOR TO START OF WORK.
4. CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES FOR CLEARANCES AND WORK INCLUDED PRIOR TO START OF WORK.
5. KEEP ALL PIPING CLEAR FROM LOAD BEARING FOOTINGS.
6. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS, MOUNTING HEIGHTS AND COLORS OF ALL PLUMBING FIXTURES.
7. ALL VENTS SHALL TERMINATE NOT LESS THAN 10 FEET FROM, OR NOT LESS THAN 3 FEET ABOVE FRESH AIR INTAKES, WINDOWS, DOORS OR OTHER OPENINGS PER CODE SECTION 906.2
8. PROVIDE AND INSTALL ACCESS PANELS AT ALL LOCATION OF WATER HAMMER ARRESTORS. PANELS TO BE MINIMUM OF 12 X 12 OR AS REQUIRED. FINISH SELECTED BY ARCHITECT.
9. CLEANOUTS SHALL BE INSTALLED PER CALIFORNIA PLUMBING CODE SECTION 707, 719 OF THE COUNTY OF LOS ANGELES PLUMBING CODE.
10. SLOPE OF BUILDING SEWERS SHALL NOT BE LESS THAN 2% UNLESS NOTED OTHERWISE.
11. ALL DOMESTIC HOT WATER PIPING SHALL BE INSULATED AS REQUIRED BY CALIFORNIA ENERGY COMMISSION TABLE 120.3-A OF THE BUILDING ENERGY EFFICIENCY STANDARDS. INSULATION SHALL HAVE A FIRE HAZARD CLASSIFICATION 25/50 COMPOSITE RATING.

PIPE SIZE	INSULATION THICKNESS	INSULATION VALUE
< 1"	1"	K FACTOR = 0.25
1" - 1-1/2"	1-1/2"	K FACTOR = 0.25
2" <	2"	K FACTOR = 0.25

12. CIRCULATING HOT WATER SYSTEMS SHALL BE EQUIPPED WITH A CONTROL CAPABLE OF AUTOMATICALLY TURNING OFF THE CIRCULATING PUMPS WHEN HOT WATER IS NOT REQUIRED (TIME CLOCK).
13. ALL SERVICE WATER HEATING EQUIPMENT TO BE IN COMPLIANCE WITH THE CALIFORNIA ENERGY COMMISSION (CEC) REQUIREMENTS AND BE SO LABELED.
14. COORDINATE WITH ELECTRICAL TRADE PRIOR TO ORDERING EQUIPMENT FOR AVAILABLE VOLTAGES AT EQUIPMENT LOCATIONS.
15. ALL HOSE BIBBS, WALL HYDRANTS AND JANITORIAL SERVICE SINKS SHALL BE EQUIPPED WITH APPROVED, PROPERLY INSTALLED ATMOSPHERIC TYPE VACUUM BREAKER.
16. ALL WATER CONNECTIONS TO HVAC EQUIPMENT SHALL BE PROTECTED BY APPROVED, REDUCED PRESSURE BACKFLOW PREVENTION DEVICES, TESTED AND CERTIFIED PRIOR TO USE. DEVICES SHALL BE ACCESSIBLE FOR TEST AND MAINTENANCE. PROVIDE FUNNEL DRAIN AND INDIRECT WASTE PIPING FOR BACKFLOW DEVICES DISTANT FROM FLOOR SINKS.
17. NATURAL GAS LINES SHALL NOT BE LOCATED UNDER ANY STRUCTURE PER 2022 CPC, SECTION 1210.1.6
18. DO NOT USE METALLIC GAS LINES TO GROUND ELECTRICAL SYSTEM.
19. PROVIDE COATED 12 GAUGE COPPER WIRE ATTACHED TO POLYETHYLENE GAS YARD PIPING FOR TRACING PURPOSE. TERMINAL WIRES SHALL BE IDENTIFIED IN LABELED ACCESS BOXES.
20. FOR LOCATION OF PIPING SLEEVES AND FLOOR OPENINGS THROUGH STRUCTURAL FLOOR SLABS, REFER TO DETAILS INDICATED IN STRUCTURAL DRAWINGS.
21. CONTRACTOR SHALL PATCH AND REPAIR ALL SURFACE AREAS DAMAGED BY THEIR OPERATION.
22. ALL VALVES, UNIONS, ETC. TO BE LINE SIZE UNLESS OTHERWISE INDICATED ON DRAWINGS.
23. UNIONS SHALL BE PROVIDED AND INSTALLED AFTER EACH THREADED TYPE VALVE AND PRIOR TO EQUIPMENT CONNECTIONS.
24. ANY DEVIATION FROM THE DRAWINGS OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION.
25. UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL PLANS NO STRUCTURAL MEMBER SHALL BE CUT. NEITHER DRILLED NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND THE DIVISION OF THE STATE ARCHITECT.
26. FOR THE PURPOSE OF CLEARNESS AND LEGIBILITY, THE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND ALTHOUGH SIZES AND LOCATION OF EQUIPMENT IS DRAWN TO SCALE WHEREVER POSSIBLE, THE CONTRACTOR SHALL MAKE USE OF ALL DATA IN ALL OF THE CONTRACTOR DOCUMENTS AND VERIFY THIS INFORMATION BEFORE ORDERING, FABRICATING OR INSTALLING OF ANY MATERIALS.
27. ALL INTERIOR CONDENSATE PIPING SHALL BE INSULATED WITH CLOSED CELL FOAM INSULATION; WITH FIRE HAZARD CLASSIFICATION 25/50 COMPOSITE RATING.
28. CONTRACTOR SHALL PROVIDE AS-BUILTS, CAD GENERATED AND DRAWN TO THE SAME SCALE THAT CONSTRUCTION DRAWINGS INDICATE (I.E. ENLARGED PLANS @ 1/4"=1'-0") SUBMIT 6 SETS OF HARD COPIES AND 1 ELECTRONIC COPY ON CD-ROM. CAD DRAWINGS SHALL BE AUTOCAD LATEST VERSION. COORDINATE REQUIREMENTS WITH OWNER.
29. PROVIDE WRITTEN WARRANTY TO REPLACE ALL FAULTY MATERIALS AND/OR LABOR, AT NO COST TO OWNER, FOR A PERIOD OF ONE YEAR FROM DATE OF OWNERS ACCEPTANCE.
30. ALL DEMOLITION WORK SHALL COMPLY WITH CBC CHAPTER 33 AND CFC CHAPTER 33.
31. EXISTING BUILDING SEWER AND BUILDING DRAINS MAY BE USED IF SUCH SEWER HAVE BEEN PROPERLY MAINTAINED AND FOUND UPON EXAMINATION AND TEST PERFORMED BY THE OWNER OR OWNERS DESIGNATED AGENT THAT THEY ARE IN WORKING CONDITION AND FREE FROM ANY DEFECT.
32. IN ORDER TO MAINTAIN 1%SLOPE PIPING, DOUBLE COMBINATION FITTINGS ARE NOT PERMITTED TO BE INSTALLED IN HORIZONTAL POSITION. AS AN ALTERNATIVE, TWO COMBINATION WYE & 1/8 BENDS FITTINGS MAY BE USED.
33. EACH HORIZONTAL VENT SHALL RISE VERTICALLY TO A POINT NOT LESS THAN SIX (6) INCHES IN HIEGHT ABOVE THE FLOOR RIM LEVEL OF THE FIXTURE BEFORE BEING CONNECTED TO ANY OTHER VENT.
34. NO MORE THAN 1/3 OS THE TOTAL PERMITTED LENGTH, PER TABLE 703.2 OF ANY MINIMUM SIZED VENT SHALL BE INSTALLED IN A HORIZONTAL POSITION.
35. GAS PIPING INSTALLED EXPOSED TO THE ELEMENTS (OUTDOORS) SHALL BE PROTECTED AGAINST CORROSION IN COMPLIANCE WITH CODE 1210.2
36. TEMPERATURE AND PRESSURE RELIEF VALVE AT STORAGE WATER HEATER SYSTEM SHALL BE INSTALLED PER LISTING OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
37. NEW OR REPAIRED POTABLE WATER SYSTEM SHALL BE DISINFECTED PRIOR TO USE IN COMPLIANCE WITH CODE SECTION 609.10
38. WATER HEATER/SUPPLY TANK SHALL BE EQUIPPED WITH VACUUM RELIEF VALVE THAT IS IN ACCORDANCE WITH CSA Z21.22
38. HORIZONTAL DRAIN PIPING SHALL BE RUN NOT LESS THAN 1/4 INCH PER FOOT OR 2 PERCENT TOWARDS POINT OF DISPOSAL, SUCH PIPE OR PIPING 4 INCHES OR LARGER IS DIAMETER SHALL BE PERMITTED TO HAVE A SLOPE OF NOT LESS THAN 1/8 INCH PER FOOT OR 1 PERCENT , WHERE FIRST APPROVED BY AUTHORITY HAVING JURISDICTION.
39. PROPOSED ADDITION, ALTERATION OR IMPROVEMENTS REQUIRE ALL NONCOMPLIANT FIXTURES TO BE REPLACED WITH WATER CONSERVING PLUMBING FIXTURES. (CIVIL CODE SECTION 1101.5) RESIDENTIAL (CIVIL CODE SECTION 1101.4

FIRE PROTECTION GENERAL NOTES

1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH NFPA #13 1999 EDITION. PER HEALTH & SAFETY CODE 13108 THE CITY OF ANAHEIM FIRE MARSHALL IS THE SOLE AUTHORITY FOR ENFORCEMENT (INCLUDING INSPECTIONS) OF FIRE AND LIFE SAFETY STANDARDS.
2. ALL SPRINKLER PIPING SHALL BE CONCEALED ABOVE CEILING. FINAL HEAD LOCATION, TYPE AND FINISH SHALL BE APPROVED BY THE ARCHITECT.
   a. SPRINKLER HEADS:
   (1) SUSPENDED CEILING AREAS: SUPPLY AND INSTALL RECESSED HEADS.
   (2) GYPSUM BOARD CEILING AREAS: SUPPLY AND INSTALL FULLY CONCEALED HEADS WITH FACTORY FINISHED COVERPLATE, TO MATCH ADJACENT CEILING SURFACE FINISH PAINT.
3. CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES. COORDINATE SPRINKLER HEAD LOCATIONS AND PIPING WITH LIGHT FIXTURES, SPEAKERS AND DIFFUSERS. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND DETAIL OF PARTITIONS, CEILINGS, SOFFITS AND CEILING TYPE. SPRINKLER HEADS LOCATED IN ACOUSTICAL TILE CEILINGS SHALL BE INSTALLED IN THE CENTER LINE OF THE TILE.
4. INSTALLATION OF THE FIRE SPRINKLER SYSTEM SHALL NOT BE STARTED UNTIL COMPLETE PLANS & SPECIFICATIONS (INCLUDING WATER SUPPLY INFORMATION) HAVE BEEN APPROVED BY THE CITY OF ANAHEIM FIRE MARSHALL.
5. AT VARIOUS STAGES AND UPON COMPLETION, SYSTEM SHALL BE TESTED IN THE PRESENCE OF THE ENFORCING AGENCY.

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4701 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — MECHANICAL — No. M38752 — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
PUBLIC WORKS
09/11/2025 1:38:39 PM

This set of plans and specifications shall be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the approval of the Building and Safety Division. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 06-24-2024
SHEET TITLE:

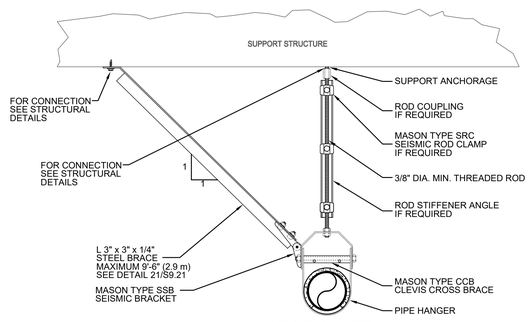
PLUMBING GENERAL NOTES SYMBOLS AND ABBREVIATIONS

SCALE: N.T.S.= 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

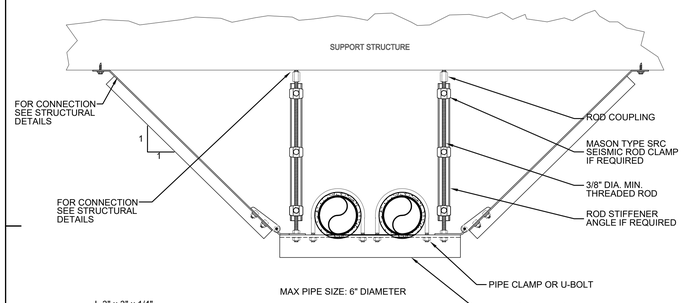
P001

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\P\21085P001.dwg 7-18-25-4:42 PM



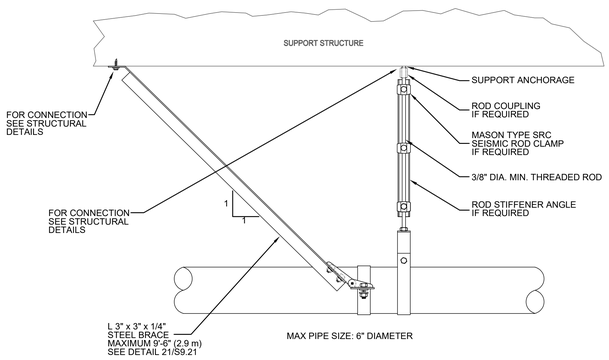
TRANSVERSE SEISMIC SOLID BRACE
FOR CLEVIS SUPPORTED PIPE/CONDUIT

PIPE HANGER DETAIL	SCALE	
	NONE	1



TRANSVERSE SEISMIC CABLE BRACE FOR
FOR TRAPEZE SUPPORTED PIPE/CONDUIT

PIPE HANGER DETAIL	SCALE	
	NONE	2



LONGITUDINAL SEISMIC SOLID BRACE
FOR CLEVIS SUPPORTED PIPE/CONDUIT

PIPE HANGER DETAIL	SCALE	
	NONE	3

DRAINAGE FIXTURE UNITS (EXISTING)

QUANTITY	FIXTURE	F.U.	TOTAL F.U.
9	WATER CLOSET	4	36
2	URINAL	2	4
8	LAVATORY	1	8
8	SINK	2	16
1	DRINKING FOUNTAIN	0.5	0.5
1	SERVICE SINK	3	3
2	HOSE BIBB	2.5/1	3.5
	TOTAL		71

DRAINAGE FIXTURE UNITS (NEW)

QUANTITY	FIXTURE	F.U.	TOTAL F.U.
10	WATER CLOSET	4	40
0	URINAL	2	0
8	LAVATORY	1	8
3	SINK	2	6
4	DRINKING FOUNTAIN	0.5	2
1	SERVICE SINK	3	3
3	HOSE BIBB	2.5/1	4.5
	TOTAL		63.5

DOMESTIC WATER LOADS (EXISTING)

QUANTITY	FIXTURE	F.U.	TOTAL F.U.
9	WATER CLOSET	5	45
2	URINAL	4	8
8	LAVATORY	1	8
8	SINK	2	16
1	DRINKING FOUNTAIN	0.5	0.5
1	SERVICE SINK	3	3
2	HOSE BIBB	2.5/1	3.5
	TOTAL		84

DOMESTIC WATER LOADS (NEW)

QUANTITY	FIXTURE	F.U.	TOTAL F.U.
10	WATER CLOSET	5	50
0	URINAL	4	0
8	LAVATORY	1	8
3	SINK	2	6
4	DRINKING FOUNTAIN	0.5	2
1	SERVICE SINK	3	3
3	HOSE BIBB	2.5/1	4.5
	TOTAL		73.5

WATER PRESSURE CALCULATION

METER LOCATION: 600 E. MARIPOSE STREET ALTADENA, CA. 91001

TOTAL FIXTURE UNITS 73.5 = 59 G.P.M.
FLUSHOMETER (X) TANK TYPE ( ) FIXTURES PREDOMINANTLY USED
NUMBER OF BUILDING STORIES 2
METER SIZE 2 INCH - 59 G.P.M. AT 100% CAPACITY
REQUIRED BUILDING SERVICE SIZE 2 INCH

NORMAL MINIMUM PRESSURE AT MAIN (BASED ON ANNUAL LOW READING)	HIGH 99	LOW 91	PSI
ADJUSTED REGULATED PRESSURE		75	PSI
DEVELOPED PRESSURE LOSS THROUGH METER		2.3	PSI
PRESSURE REGULATOR REQUIRED ? YES (X) NO ( )			
REGULATED PRESSURE PSI = PSI (FALLOFF PRESSURE)		11	PSI
METER (REGULATOR) TO HIGHEST OUTLET (STATIC PRESSURE DROP)	30 FT. x .433 =	12.99	PSI
RESIDUAL PRESSURE REQUIRED		25	PSI
PRESSURE AVAILABLE FOR DROP (DESIGN PRESSURE)		23.71	PSI
MAXIMUM LENGTH OF WATER SYSTEM	200 + 25 % =	250	PSI
ALLOWABLE MAXIMUM FRICTION LOSS PER 100 FT. OF PIPE		9.48	PSI

PIPE SIZING BASED ON 5.0 PSI/100' AND MAX. VELOCITY OF 8 FPS

PIPE SIZE	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
GPM	2	4	10	17	27	59	104	150	225
FV FU	1	5	13	25	47	171	401	638	1132
FT FU	-	-	-	-	-	-	-	-	-
FT/SEC	-	-	-	-	6.0	8.0	8.0	8.0	8.0

PIPE SIZING BASED ON 3.0 PSI/100' AND MAX. VELOCITY OF 5 FPS

PIPE SIZE	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
GPM	3	6	12	20	-	-	-	-	-
FT FU	1	4	12	23	-	-	-	-	-
FV FU	-	-	-	-	-	-	-	-	-
FT/SEC	-	-	5.0	5.0	6.0	6.0	8.0	8.0	8.0

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	ROUGH-IN-SIZE TRAP	S/W	V	CW	HW	FIXTURE UNIT WASTE	WATER	DESCRIPTION/REMARKS
WC-1	WATER CLOSET	INT	4"	2"	1"	-	4	5	AMERICAN STANDARD #3461.001 MADERA FLOWISE, FLOOR MOUNTED, ELONGATED VITREOUS CHINA BOWL WITH SYPHON JET ACTION. PROVIDE WITH SLOAN #111 ESS-1.28-TMO-HW- 24V, HARDWIRED, SENSOR OPERATED 1.28 GPF FLUSH VALVE, OLSONITE #95CT OPEN FRONT SEAT.
WC-2	WATER CLOSET (ACC)	INT	4"	2"	1"	-	4	5	AMERICAN STANDARD #3351.101 APWALL WALL MOUNTED, ELONGATED VITREOUS CHINA BOWL SYPHON JET ACTION. PROVIDE WISLOAN #111 ESS-1.28-TMO-HW-24V HARDWIRED, SENSOR OPERATED 1.28 GPF FLUSH VALVE, OLSONITE #95CT OPEN FRONT SEAT, PRODUCT SHALL SIXTDE SUPPORT SMITH #2000 SERIES OR EQUAL
LV-1	LAVATORY (ACC)	1 1/2"	2"	1 1/2"	1/2"	1/2"	1	1	AMERICAN STANDARD #0497.221 "OVALYN (21-1/2"x17-3/8") UNGLAZED RIM UNDER COUNTER MOUNTED VITREOUS CHINA OVAL BASIN/BOWL. PROVIDE W/ TOTO HELIX ECOPOWER #TEL113-D20E FAUCET, TLT20 THERMOSTATIC MIXING VALVE, #TELC103R CONTROLLER 0.11 GAL.CYCLE, AND LOOSEKEY ANGLE STOPS, WITH BRAIDED STAINLESS STEEL SUPPLIES AND 17 GAUGE P-TRAP.
LV-2	LAVATORY (ACC)	1 1/2"	2"	1 1/2"	1/2"	1/2"	1	1	AMERICAN STANDARD, #0356.137 "LUCERNE" WALL MOUNTED VITREOUS CHINA BOWL WITH RIGHT HAND SIDE SOAP DISPENSER HOLE, PROVIDE TOTO HELIX ECOPOWER #TEL113-D20E FAUCET WITH TLT20 TMV, #TELC103R CONTROLLER 0.11 GAL.CYCLE,) LOOSEKEY ANGLE STOPS, BRAIDED STAINLESS STEEL SUPPLIES AND 17 GAUGE P-TRAP. FIXTURE SUPPORT JR SMITH #0710 SERIES OR EQUAL
SK-1	SINK (ACC)	1 1/2"	2"	1 1/2"	1/2"	1/2"	2	2	JUST #US-ADA-1830-A, DOUBLE COMP UNDERMOUNT, ADA SINK, 18 GA, TYPE 304 STAINLESS STEEL, CHICAGO #201-AE35-317ABCP, DECK MOUNTED FAUCET WITH WRISTBLADE HANDLE, 1.8 GPM AND LOOSE-KEY STOPS, OFFSET GRID STRAINER AND BRAIDED STAINLESS STEEL SUPPLIES AND 17 GAUGE P-TRAP
SK-2	SINK (ACC)	1 1/2"	2"	1 1/2"	1/2"	1/2"	2	2	JUST #US-ADA-1830-A, DOUBLE COMP UNDERMOUNT, ADA SINK, 18 GA, TYPE 304 STAINLESS STEEL, CHICAGO #201-AGNAE35-317AB DECK MOUNTED FAUCET (1.5 GPM) WITH LOOSE-KEY STOPS, OFFSET GRID STRAINER WITH BRAIDED STAINLESS STEEL SUPPLIES AND 17 GAUGE P-TRAP
MS-1	MOP/SERVICE SINK	3"	3"	2"	1/2"	1/2"	3	2	AMERICAN STANDARD #7745.811, ACID RESISTANT ENAMELED CAST IRON, FLOOR MOUNTED WITH RIM GUARD, CHICAGO #897-CP MIXING FAUCET WITH ATMOSPHERIC VACUUM BREAKER, PAIL HOOK, WALL BRACE, MALE HOSE THREADED OUTLET.
DF-1	DRINKING FOUNTAIN (ACC)	1 1/2"	2"	1 1/2"	1/2"	-	.5	.5	ELKAY #LZWS-LRPBM28K BOTTLE FILLING STATION WITH BI-LEVEL DRINKING FOUNTAIN, FILTERED AND REFRIGERATED WALL MOUNTED WITH FRONT BUBBLER PUSH-BUTTON ACTIVATION. COMPLETE WITH MOUNTING BRACKET OR IN-WALL FIXTURE SUPPORT AND FILTERING SYSTEM.
FD-1	FLOOR DRAIN	2"	2"	1 1/2"	1/2"	-	-	-	JR SMITH #2005Y-A, HUBLESS CAST IRON BODY, 5" ROUND BRASS GRATE WITH VANDAL PROOF SCREWS, P-TRAP AND TRAP PRIMER CONNECTION.
TP-1	TRAP PRIMER	-	-	-	1/2"	-	-	-	JR SMITH #2694, LEAD-FREE BRASS CONSTRUCTION WITH SHUT-OFF VALVE, BEHIND ACCESS PANEL. 125 PSIG MIN. 3 PSI PRESSURE DROP ACTIVATION. (SIZE PER MANUFACTURERS RECOMMENDATIONS) ASSE 1018 COMPLIANT.
WHA-1	WATER HAMMER ARRESTOR	-	-	-	-	-	-	-	JR SMITH "HYDROTROL" 5000 SERIES, BEHIND ACCESS PANEL. (SIZE IN ACCORDANCE WITH PDI STANDARDS)
CWC-1	COLD WATER CONNECTION	-	-	-	1/2"	-	-	-	GUY GRAY #BIM875, 18 GAUGE FACEPLATE, HOT DIPPED GALVANIZED STEEL WITH COMPRESSION ANGLE VALVE.
RR-1	ROOF RECEPTOR	-	2"	-	-	-	-	-	JR SMITH ROOF RECEPTOR #3960, INDIRECT WASTE RECEPTOR DRAIN, 7-1/4" DIAMETER, CAST IRON RECEPTOR WITH SOLID WATER DAM AND BOTTOM STRAINER. COMPLETE WITH STAINLESS STEEL VANDAL-PROOF SCREWS.

ELECTRIC WATER HEATER SCHEDULE

SYMBOL	LOCATION	MFR/ MODEL No.	STOR. (GAL.)	RECOV. @ 60°F RISE (GPH.)	TANK SIZE DIA (IN)	TANK SIZE HT (IN)	TEMP IN (F°)	TEMP OUT (F°)	ELECTRICAL DATA KW	VOLT	PH	OPER. WEIGHT (LBS)	REMARKS
EWH 1	UNDER SINK MTD. 308 & 309	CHRONOMITE MODEL M-20L/208	-	-	-	-	60	117	4.16	208	1	7	WALL MOUNT UNDER SINK. CIRCUIT WITH DISCONNECT. SEE DETAIL 4/P003
EWH 2	UNDER SINK MTD. 202 & 314	CHRONOMITE MODEL M-30L/208	-	-	-	-	60	103	6.24	208	1	7	WALL MOUNT UNDER SINK. CIRCUIT WITH DISCONNECT. SEE DETAIL 4/P003
EWH 3	JANITOR 114	AO SMITH #DEL-20S	19	27	21.75	22.25	60	120	4.0	208	1	231	WALL MOUNT HEATER WITH STAND. SEE DETAIL 5/P003. PROVIDE W/ INSULATION COMPLY WITH CEC 110.3(C)A-C. REFER TO DETAIL 9/P003 FOR INSULATION REQUIRED.

EXPANSION TANK SCHEDULE

SYM.	LOCATION	MFR/MODEL	TANK VOLUME (GALLONS)	MAXIMUM ACCEPTANCE FACTOR	CHARGING PRESSURE (PSIG)	SYSTEM CONNECTION SIZE (NPT)	OPER. WT. (LBS.)	REMARKS
ET 1	JANITOR 114	AMTROL THERM-X-TROL ST-5-C	2.1	.9	50	3/4"	22.51	175 PSI ASME CONSTRUCTION SIZED FOR UP TO 60 GALLON STORAGE TANK.

CIRCULATING PUMP SCHEDULE

SYMBOL	LOCATION	MFR./ MODEL No.	TYPE	GPM	HEAD (FT.)	RPM	ELECTRICAL DATA WATTS	VOLT	PHASE	HERTZ	OPER. WEIGHT (LBS)	REMARKS
CP 1	JANITOR 114	BELL & GOSSET NBF-10S/LW	INLINE	3	10	2800	52	120	1	60	9	ALL BRONZE CONSTRUCTION, COMPLETE W/ AQUASTAT AND TIME CLOCK. SEE DETAIL 7/P0-0.3

EQUIPMENT SCHEDULE

SYMBOL	EQUIPMENT	MFR./ MODEL No.	MOTOR DATA HP	RPM	VOLTS	PHASE	CAP.	GPM	WEIGHT (LBS)	REMARKS
GD 1	GARBAGE DISPOSER	IN-SINK ERATOR BADGER 1	1/3	1725	120	1Ø	-	-	15	COMPLETE WITH POWER CORD, WALL SWITCH AND SINK ADAPTOR ASSEMBLY.

HOT WATER DEMAND TABLE

PROJECT: ALTADENA MAIN LIBRARY
BUILDING TYPE: LIBRARY

FIXTURE TYPE	QUANTITY	HOT WATER GPH EA	HOT WATER GPH TOTAL
LAVATORY (PRIVATE)	3	2	6.00
LAVATORY (PUBLIC)	3	6	18.00
SERVICE SINKS	1	20	20.00
TOTAL			44.00

WATER HEATER SIZE	DEMAND FACTOR = 0.30	13.20 = GPH RECOVERY
	STORAGE CAPACITY FACTOR = 0.90	11.88 = GPH STORAGE
	WATER HEATER	= 12 GALLONS

NATURAL GAS LOADS (CFH)

	SPACE HEATING	WATER HEATING	OTHER	TOTAL
NEW	1350	0	0	1350
FUTURE	0	0	0	0
TOTAL	1350	0	0	1350
TOTAL DEVELOPED LENGTH:	276 FT			
SYSTEM PRESURE:	LESS THAN 2 PSI			

BASED ON CPC 2022 TABLE 1215.2(1)

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0577
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER WEIDONG GONG No. M38752 MECHANICAL STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
R.Valera
PUBLIC WORKS
06/11/2025 1:38:39 PM
This set of plans and specifications shall be kept at the job site at all times and it is unlawful to make any changes or modifications to same. In addition, no changes, additions or alterations without the prior written approval of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 06-24-2024
SHEET TITLE:

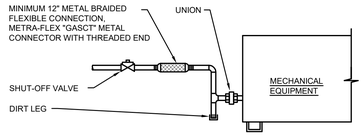
PLUMBING SCHEDULES & DETAILS

SCALE: NONE 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

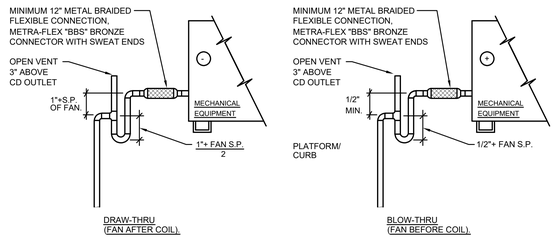
P002

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\P\21085P002.dwg 7-18-25-4:42 PM



GAS CONNECTION TO HVAC EQUIPMENT DETAIL

SCALE: NONE | 1

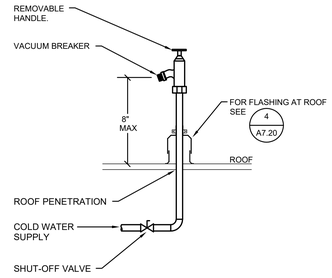


CD CONNECTION TO MECHANICAL EQUIPMENT DETAIL

SCALE: NONE | 2

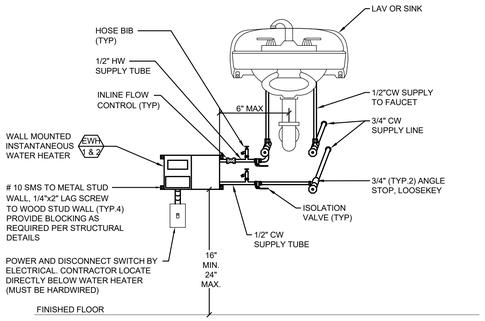
NOTE:

1. SEE PLANS FOR PIPE SIZES
2. INSULATE ALL INTERIOR CONDENSATE DRAIN PIPING WITH CLOSED CELL FOAM INSULATION.
3. SLEEVES SHALL BE PROVIDED AT ALL FLOOR AND WALL PENETRATIONS WITH 1" CLEARANCE AROUND PIPE & CAULK W/ FIRE RATED CAULKING.
4. COORDINATE WITH MECHANICAL CONTRACTOR TO DETERMINE FAN STATIC PRESSURE.



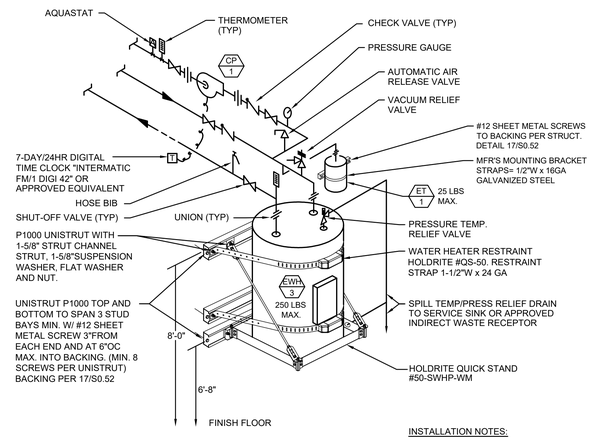
HOSE BIBB ON ROOF DETAIL

SCALE: NONE | 3



INSTANTANEOUS WATER HEATER DETAIL

SCALE: NONE | 4

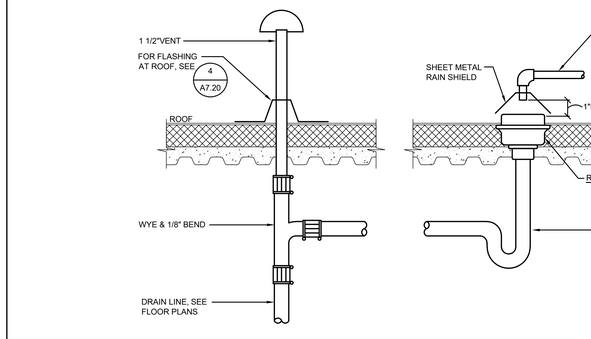


INSTALLATION NOTES:

1. INSTALL UPPER RESTRAINT 1/3 DOWN FROM TOP OF WATER HEATER.
2. INSTALL DRAIN PAN IN COMPLIANCE WITH CPC SECTION 507.5

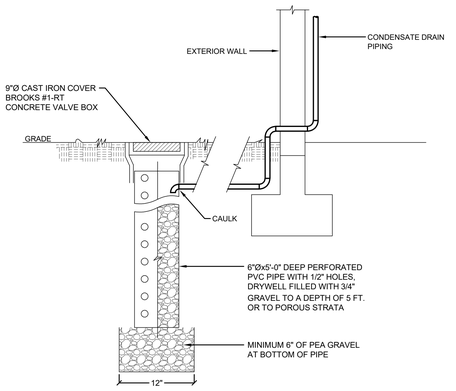
WALL MOUNTED ELECTRIC WATER HEATER PIPING/MOUNTING DETAIL

SCALE: NONE | 5



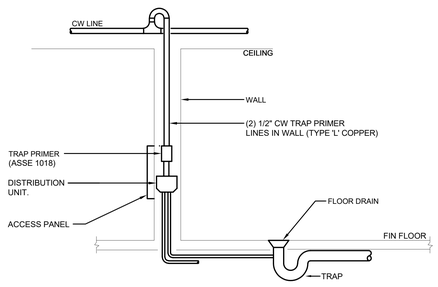
ROOF RECEPTOR PIPING DETAIL

SCALE: NONE | 6



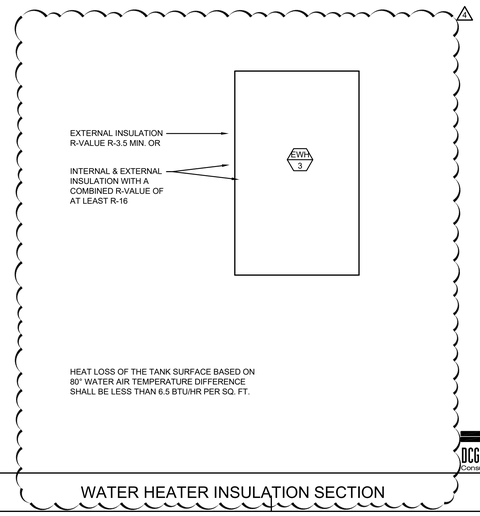
DRYWELL DETAIL

SCALE: NONE | 7



TRAP PRIMER PIPING DIAGRAM

SCALE: NONE | 8



WATER HEATER INSULATION SECTION

SCALE: NONE | 9

DCGR ENGINEERS
Consulting Mechanical and Electrical Engineers
14701 Charity Blvd Ste 210, Orange, CA 92563
Tel: 949.387.1616

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — WEIZHER G. MA — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE TITLE 28
eValera PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of building and specifications must be kept on the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT be deemed as authorization for any violation of the provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

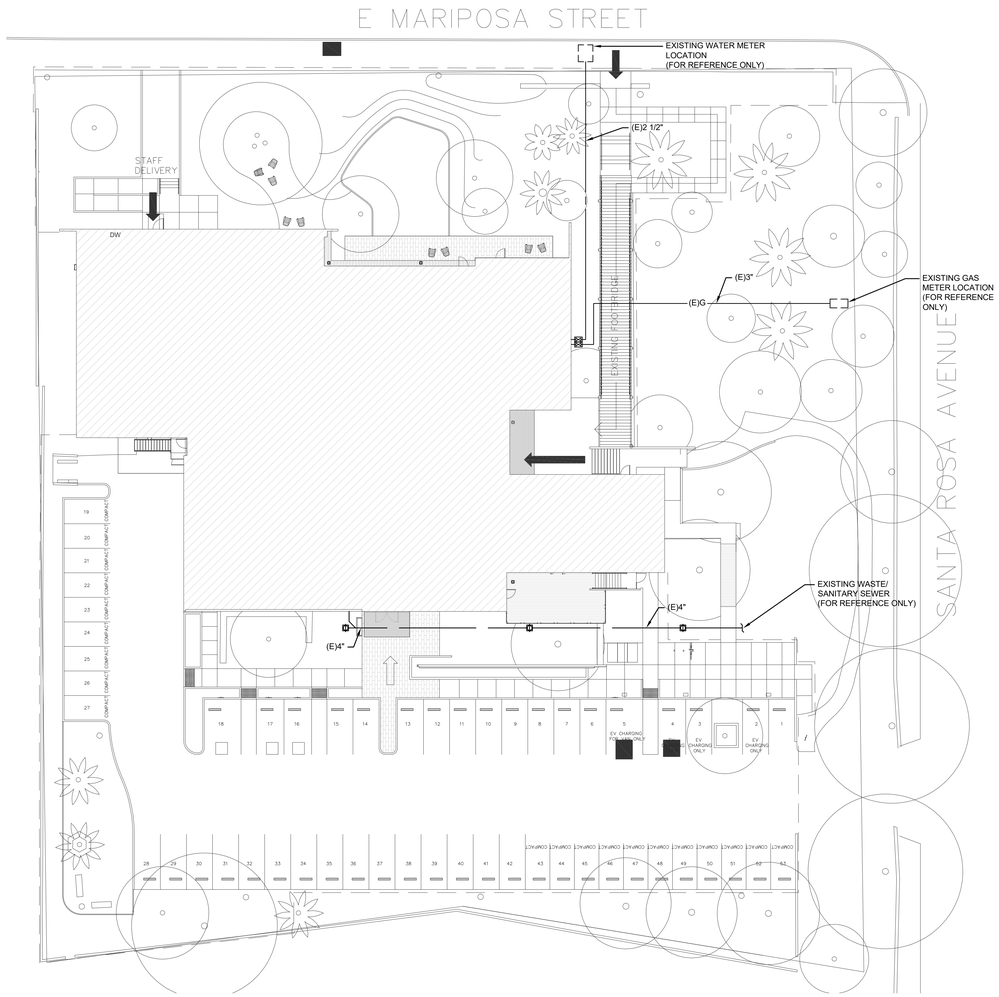
PLUMBING DETAILS

SCALE: NTS: 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P003

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\P\21085P003.dwg 7-18-25 4:42 PM



1 PLUMBING SITE PLAN
1" = 20'-0"

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
WEIGHTHER G. MA
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
R.Valera
PUBLIC WORKS
09/11/2025 1:38 PM
This set of plans and specifications shall be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

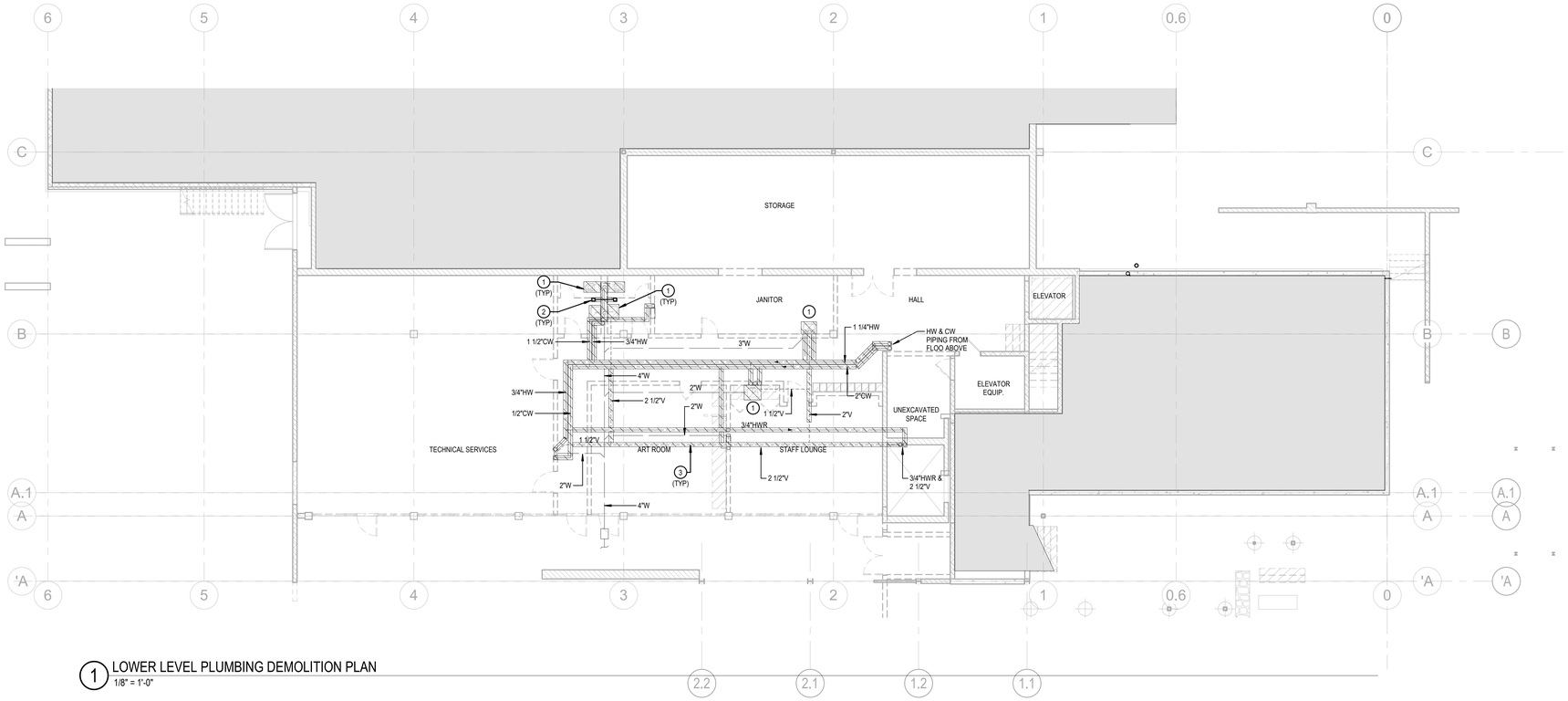
PLUMBING SITE PLAN

SCALE: NTS 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0177
Fax 909.980.7023

P111



1 LOWER LEVEL PLUMBING DEMOLITION PLAN
1/8" = 1'-0"

SHEET NOTES

1. REMOVE AND DISPOSE OF FIXTURE. REMOVE UTILITY PIPING BACK TO WALL, TO BELOW GRADE/FLOOR AND/OR UP IN WALL TO ABOVE CEILING. CAP AND ABANDON PIPING BELOW GRADE OR ABOVE CEILING. REFER TO STRUCTURAL DETAILS FOR FLOOR COVER UP.
2. REMOVE AND DISPOSE OF DRAIN FIXTURE. CAP UTILITY DRAIN PIPING BELOW GRADE/FLOOR. REFER TO STRUCTURAL DETAILS FOR FLOOR COVER UP.
3. CROSS HATCH - PIPING ABOVE CEILING TO BE REMOVED AND DISPOSED OF.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER GARCIA
No. M38752
MECHANICAL
STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
R.Valera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of drawings and specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations on these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT be held to permit or to be an approval of the violation of any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

LOWER LEVEL PLUMBING DEMOLITION PLAN

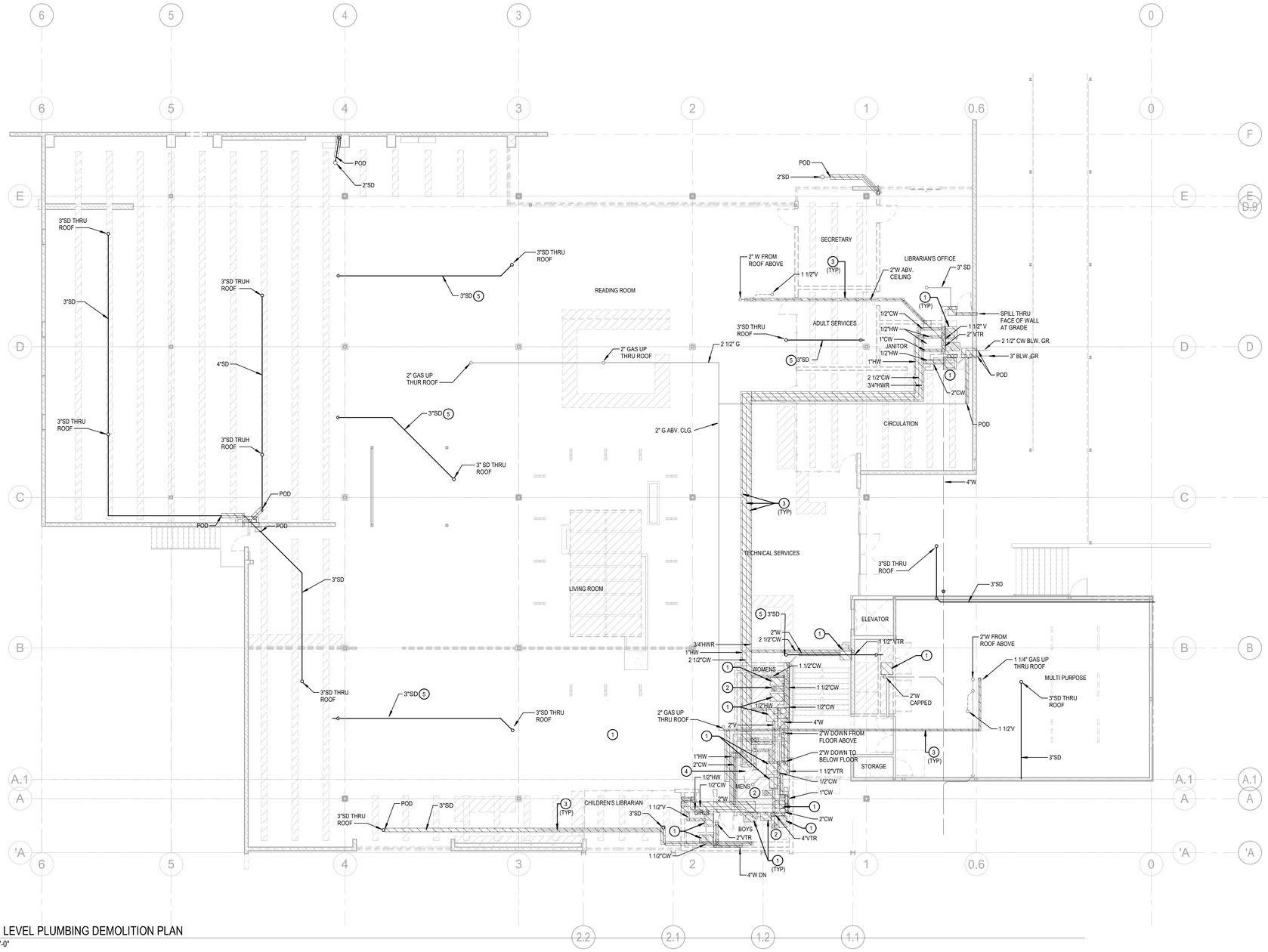
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.
©

P200

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023

7/18/2025 4:45:47 PM



1 MAIN LEVEL PLUMBING DEMOLITION PLAN
1/8" = 1'-0"

SHEET NOTES

1. REMOVE AND DISPOSE OF FIXTURE. REMOVE UTILITY PIPING BACK TO WALL, TO BELOW GRADE/FLOOR AND/OR UP IN WALL TO ABOVE CEILING. CAP AND ABANDON PIPING BELOW GRADE OR ABOVE CEILING. REFER TO STRUCTURAL DETAILS FOR FLOOR COVER UP.
2. REMOVE AND DISPOSE OF DRAIN FIXTURE. CAP UTILITY DRAIN PIPING BELOW GRADE/FLOOR. REFER TO STRUCTURAL DETAILS FOR FLOOR COVER UP.
3. CROSS HATCH-PIPING ABOVE CEILING TO BE REMOVED AND DISPOSED OF.
4. REMOVE AND DISPOSE OF WATER HEATER, VALVES, UNIONS, FITTINGS, ETC. AND ALL ACCESSORIES IN MEZZANINE/WATER HATER ROOM.
5. STORM DRIAN PIPING BELOW HIGH ROOF AREA.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 26
R.Valera
PUBLIC WORKS
08/11/2025 1:38:39 PM
This set of plans and specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT be deemed to be an approval of any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MAIN LEVEL PLUMBING DEMOLITION PLAN

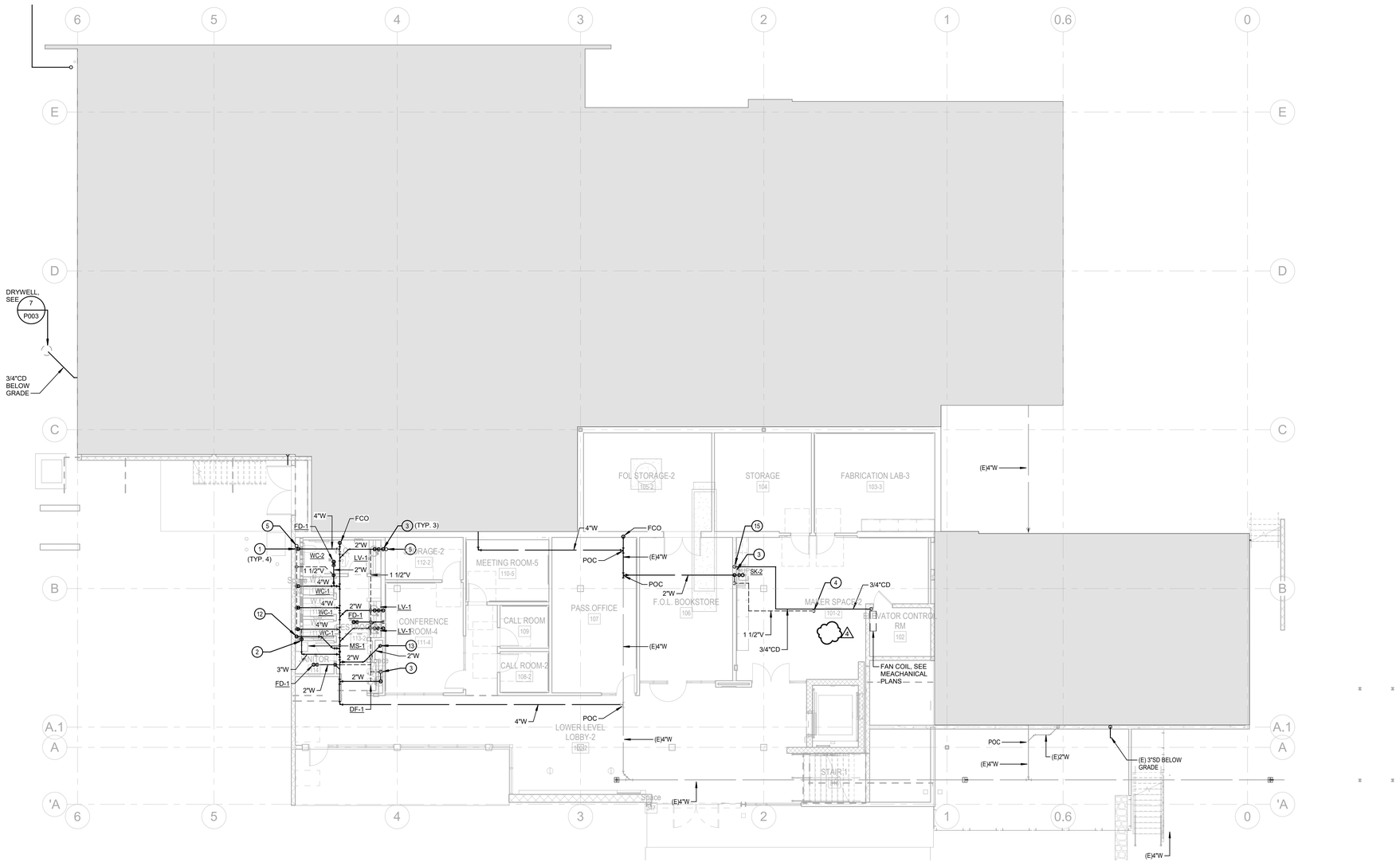
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023

P201

7/18/2025 4:45:51 PM



1 LOWER LEVEL SEWER/VENT PLAN
1/8" = 1'-0"

SHEET NOTES

1. 4"W DOWN AND 2"V UP.
2. 3"W DOWN AND 2"V UP.
3. 2"W DOWN AND 1 1/2"V UP.
4. 1 1/2"V UP TO FLOOR ABOVE.
5. 2"V UP IN WALL TO FLOOR ABOVE.
6. NOT USED.
7. NOT USED.
8. NOT USED.
9. NOT USED.
10. NOT USED.
11. NOT USED.
12. 4"W FROM FLOOR ABOVE DOWN IN CHASE/WALL.
13. 2"W FROM FLOOR ABOVE DOWN IN CHASE/WALL.
14. NOT USED.
15. 3/4"CD DOWN IN WALL, CONNECT TO SINK TAILPIECE.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 26
R.Valera
PUBLIC WORKS
06/11/2025 1:38:39 PM
This set of construction specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or revisions to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
	7/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

LOWER LEVEL SEWER/VENT PLAN

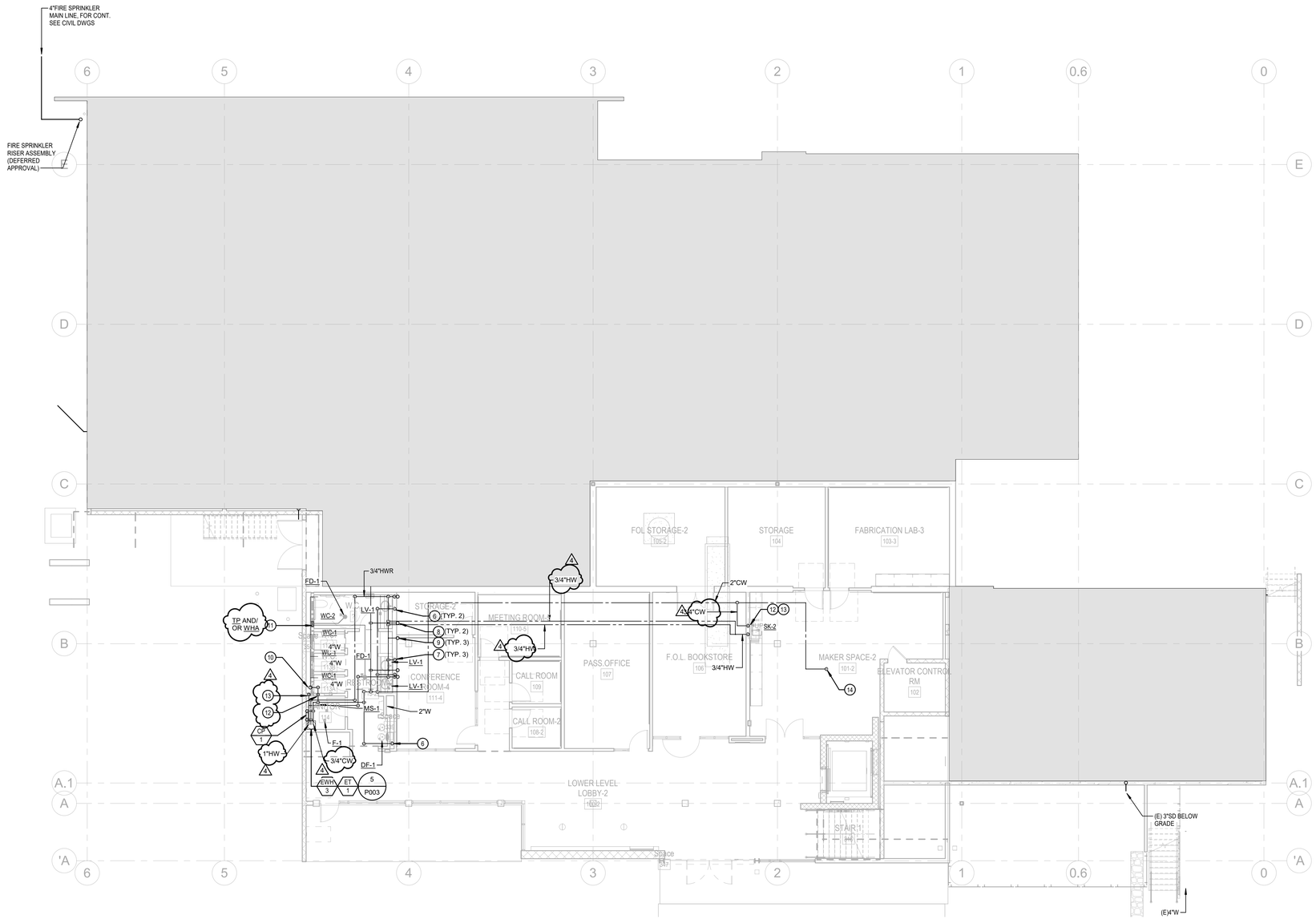
SCALE: 1/8" = 1'-0"

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P202

8/6/2025 5:33:07 PM



1 LOWER LEVEL HOT/COLD WATER PLAN
1/8" = 1'-0"

SHEET NOTES

1. NOT USED.
2. NOT USED.
3. NOT USED.
4. NOT USED.
5. NOT USED.
6. 1/2"CW DOWN IN WALL TO FIXTURE.
7. 1/2"HW DOWN IN WALL TO FIXTURES.
8. 1/2"CW UP IN WALL TO FIXTURES AT FLOOR ABOVE.
9. 1/2"HW UP IN WALL TO FIXTURES AT FLOOR ABOVE.
10. 1 1/4"CW DOWN. IN WALL WITH SOV BEHIND ACCESS PANEL TO 1 1/4"CW HEADER.
11. TP-1 AND WHWR-1 IN WALL BEHIND ACCESS PANEL.
12. 3/4"CW DOWN IN WALL TO FIXTURE.
13. 3/4"HW DOWN IN WALL TO FIXTURE.
14. 2" CW FROM FLOOR ABOVE.
15. NOT USED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

PROFESSIONAL ENGINEER — MECHANICAL — STATE OF CALIFORNIA — No. E 18982 — No. M38752

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE TITLE 28
Rvalera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of plans and specifications shall be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations in these plans or specifications without approval of the building official. The issuance of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	7/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

LOWER LEVEL HOT/COLD WATER PLAN

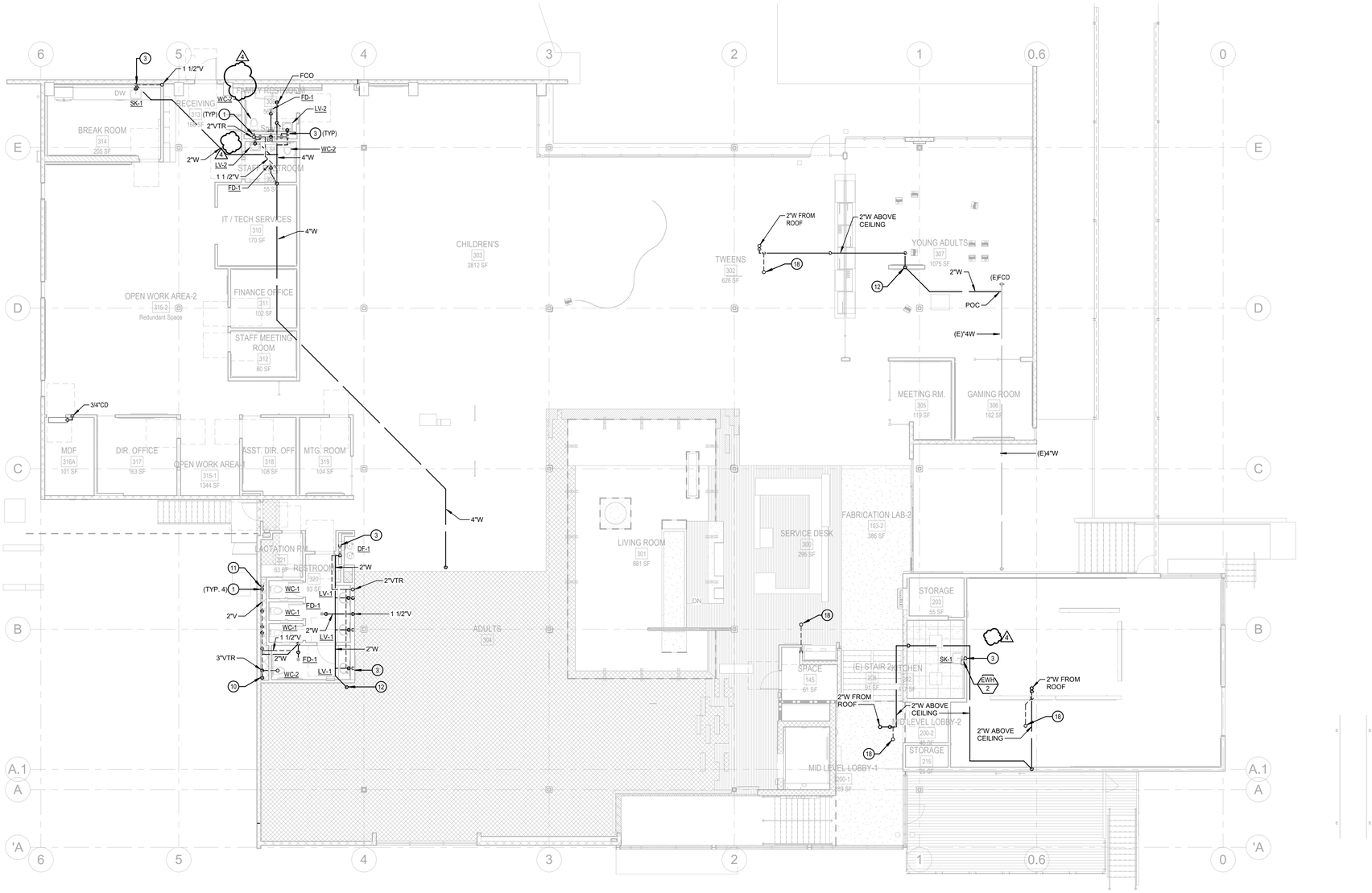
SCALE: 1/8" = 1'-0"

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4700 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P203

8/5/2025 8:03:08 PM



1 MAIN LEVEL SEWER/VENT PLAN
1/8" = 1'-0"

SHEET NOTES

1. 4"W DOWN AND 2"V UP.
2. 3"W DOWN AND 2"V UP.
3. 2"W DOWN AND 1 1/2"V UP.
4. NOT USED.
5. NOT USED.
6. NOT USED.
7. NOT USED.
8. NOT USED.
9. NOT USED.
10. 4"W IN WALL DOWN TO FLOOR BELOW.
11. 2"V UP FROM FLOOR BELOW.
12. 2"W DOWN TO FLOOR BELOW IN CHASE/WALL.
13. NOT USED.
14. NOT USED.
15. NOT USED.
16. NOT USED.
17. NOT USED.
18. 1 1/2"VTR, UTILIZE NEAREST EXITSTING VENT/ROOF OPENING.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
No. M38752
STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
R.Valera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of plans and specifications shall be kept at the job site at all times. Work is to proceed only as per changes, modifications or additions approved by the Building Official without the prior written approval of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
	7/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MAIN LEVEL SEWER/VENT PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

P204

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4700 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax.909.980.7023

8/5/2025 6:33:10 PM



1 MAIN LEVEL HOT/COLD WATER PLAN
1/8" = 1'-0"

SHEET NOTES

1. NOT USED.
2. NOT USED.
3. 3/4"CW DOWN IN WALL TO FIXTURE.
4. CWC-1 WALL, CONNECT TO EWH-2. REFER TO DETAIL 4/P003.
5. 1 1/4"CW UP FROM FLOOR BELOW.
6. 1/2"CW DOWN IN WALL TO FIXTURE.
7. 1/2"CW IN PIPE CHASE/WALL, CONNECT TO CWC-1.
8. 1 1/4"CW UP IN WALL FROM FLOOR BELOW WITH SOV BEHIND ACCESS PANEL TO 1 1/4"CW HEADER.
9. TP-1 AND WHA-1 IN WALL BEHIND ACCESS PANEL.
10. NOT USED.
11. NOT USED.
12. NOT USED.
13. 1/2"CW UP FROM FLOOR BELOW.
14. 1/2"HW UP FROM FLOOR BELOW.
15. 1"CW DOWN IN WALL WITH SOV BEHIND ACCESS PANELTO 1"CW HEADER.
16. 1/2"CW UP TO HOSE BIB ON ROOF.
17. NOT USED.
18. NOT USED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — No. M38752 — MEGHAN CHU — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 26
Rvalera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of drawings and specifications must be kept at the job site at all times but it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written approval of the Building Official. The issuance of a permit or approval of plans and specifications, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	7/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MAIN LEVEL HOT/COLD WATER PLAN

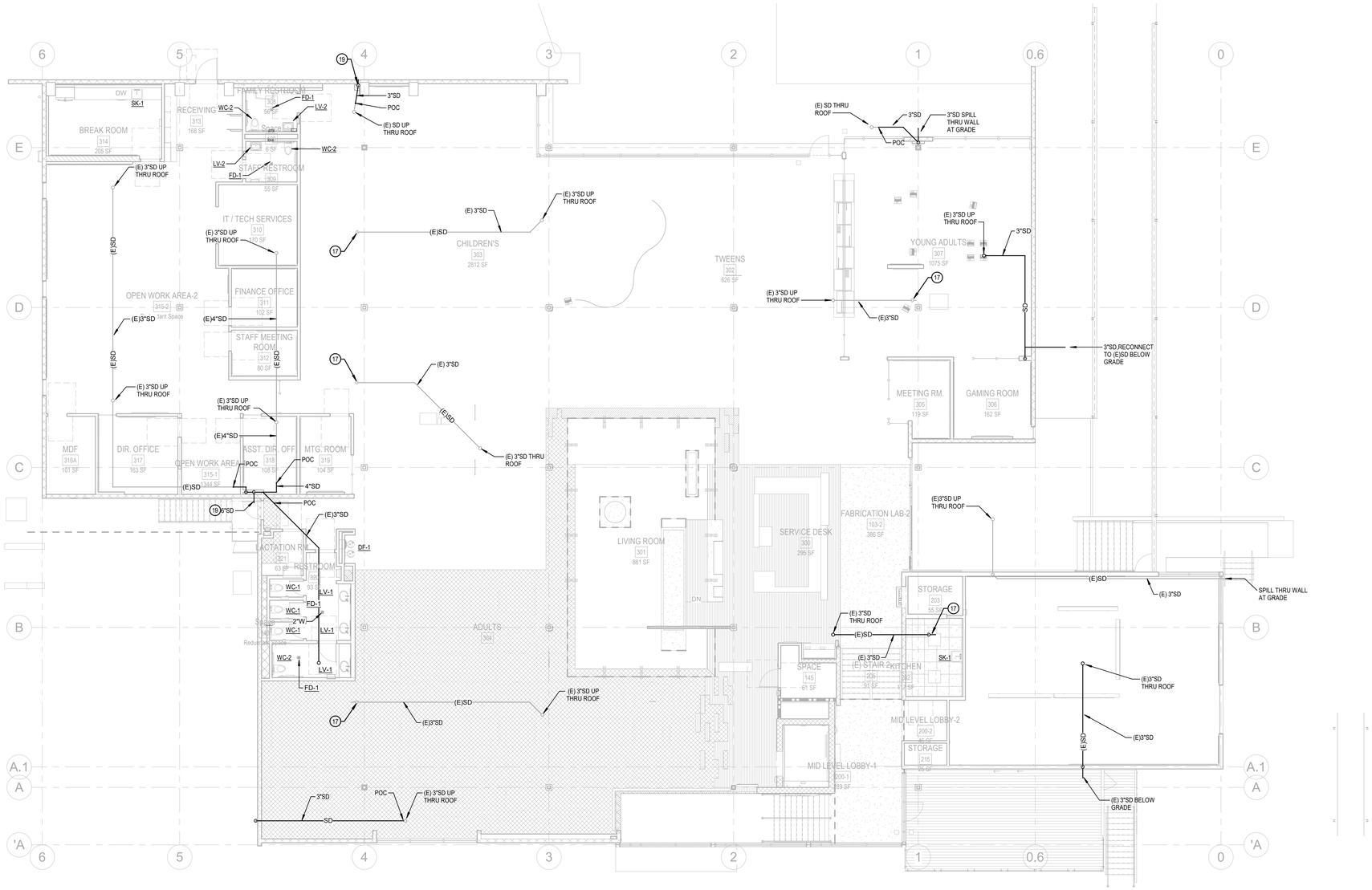
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

P205

8/6/2025 3:33:11 PM



1 MAIN LEVEL STORM DRAIN PLAN
1/8" = 1'-0"

SHEET NOTES

1. NOT USED.
2. NOT USED.
3. NOT USED.
4. NOT USED.
5. NOT USED.
6. NOT USED.
7. NOT USED.
8. NOT USED.
9. NOT USED.
10. NOT USED.
11. NOT USED.
12. NOT USED.
13. NOT USED.
14. NOT USED.
15. NOT USED.
16. NOT USED.
17. (E)SD PIPING IN PIPE/CHASE DOWN TO SPILL AT LOW ROOF.
18. NOT USED.
19. 3"SD DOWN ALONG/TIGHT TO WALL, EXTEND TO OUTSIDE OF BUILDING UTILIZING EXISITING OPENING IN WALL.

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 26
Rvalera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of plans and specifications shall be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations in these plans or specifications without the approval of the Building Official. Approval of the standards of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MAIN LEVEL STORM DRAIN PLAN

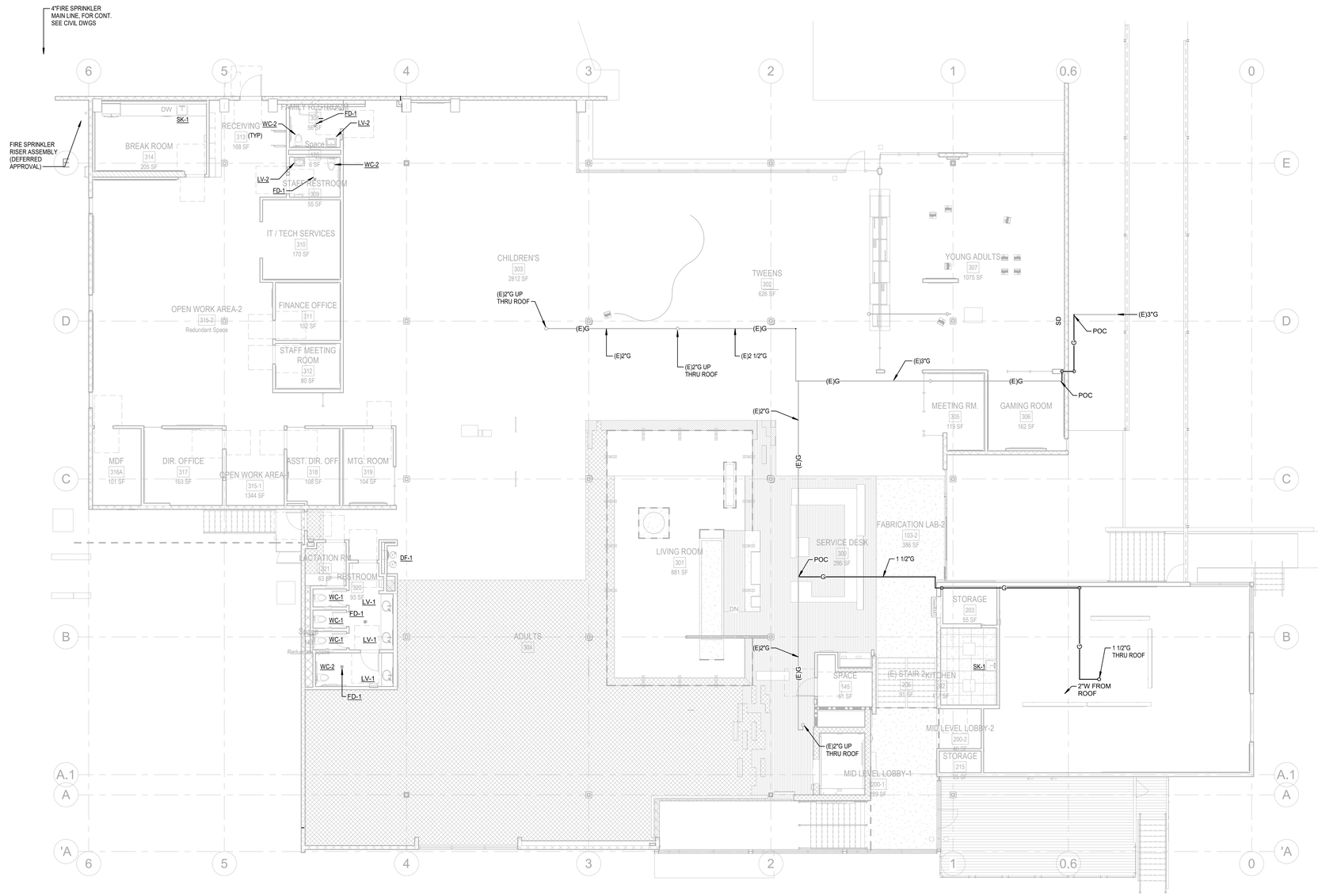
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4700 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

P206

7/18/2025 4:46:08 PM



1 MAIN LEVEL GAS PLAN
1/8" = 1'-0"

SHEET NOTES

1. NOT USED.
2. NOT USED.
3. NOT USED.
4. NOT USED.
5. NOT USED.
6. NOT USED.
7. NOT USED.
8. NOT USED.
9. NOT USED.
10. NOT USED.
11. NOT USED.
12. NOT USED.
13. NOT USED.
14. NOT USED.
15. NOT USED.
16. NOT USED.
17. NOT USED.
18. NOT USED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER GARCIA — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
Reviewer
PUBLIC WORKS
06/11/2025 1:38:39 PM
This set of plans and specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written permission of the issuing office. The stamping of this set of plans and specifications SHALL NOT be deemed to be permission or an approval to violate any law or approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MAIN LEVEL GAS PLAN

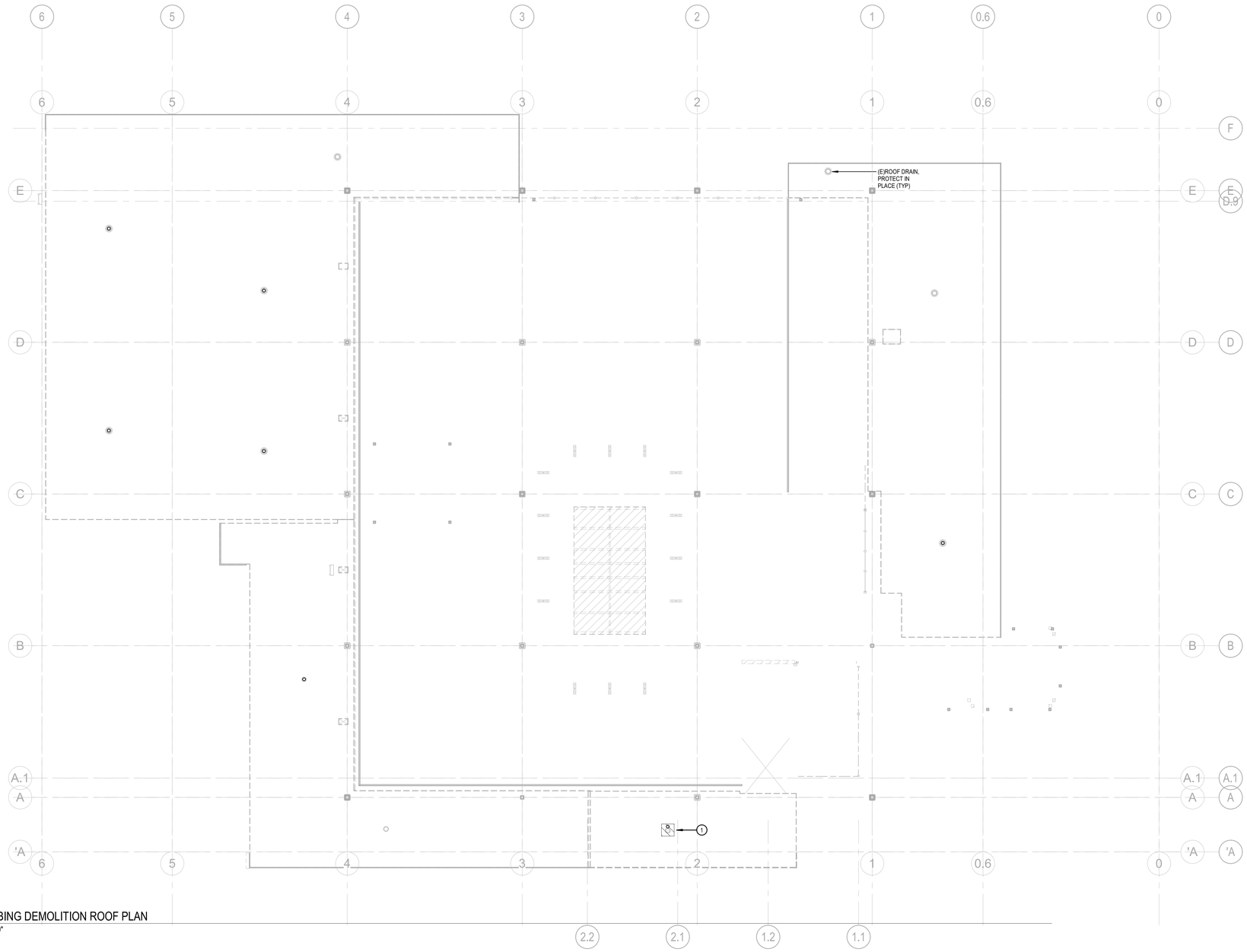
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P207

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

7/18/2025 4:46:12 PM



1 PLUMBING DEMOLITION ROOF PLAN
1/8" = 1'-0"

SHEET NOTES

1 REMOVE AND DISPOSE OF ROOF DRAIN. REFER TO ARCH PLAN FOR PATCHING OF ROOF.

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — MECHANICAL — No. M38752 — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 28
Revalera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of plans and specifications shall be kept at the job site at all times and it is unlawful to make any changes, modifications or deviations in these plans or specifications without approval from the Building Official. Approval of the stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

PLUMBING DEMOLITION ROOF PLAN

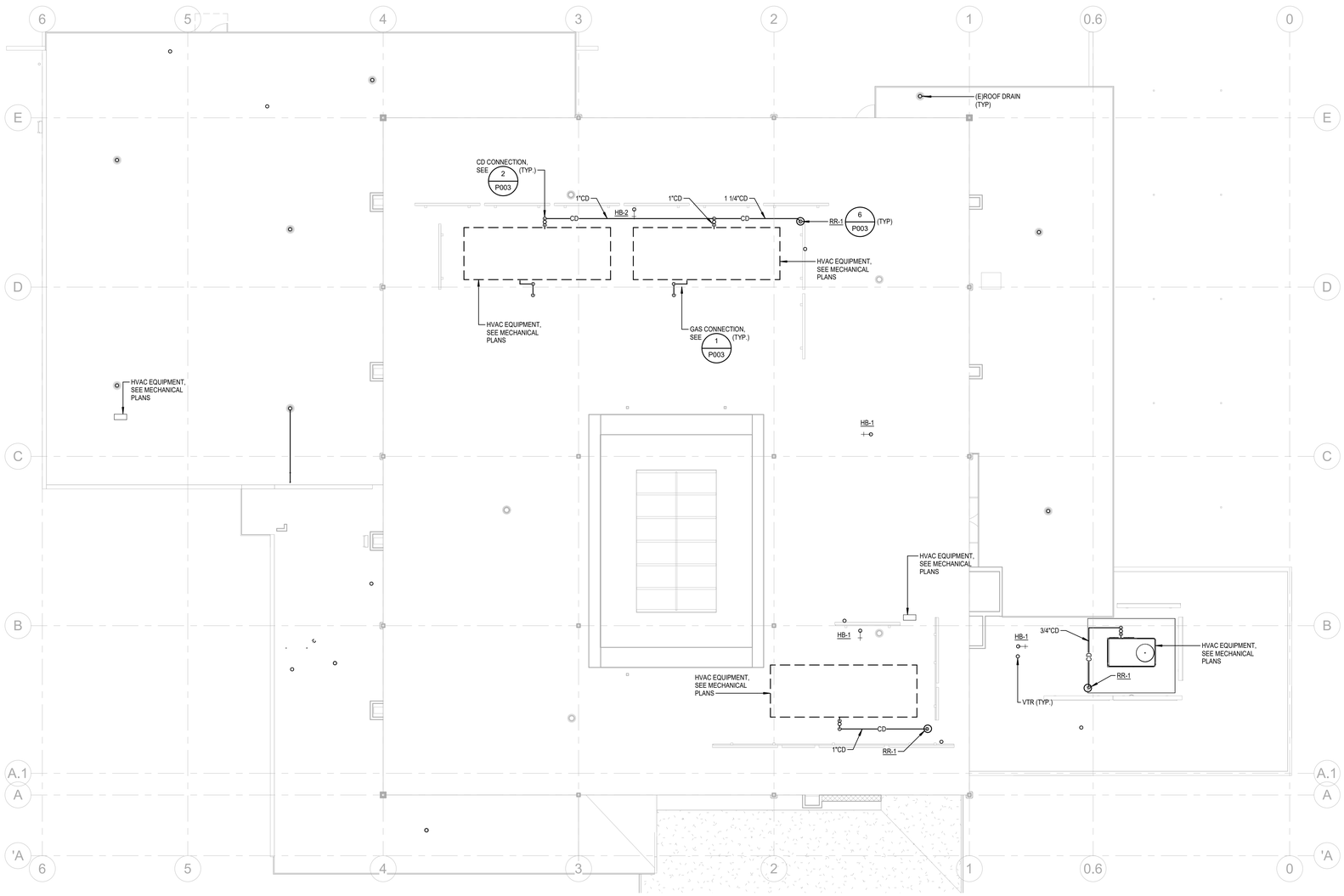
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P300

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4700 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

7/18/2024 4:46:13 PM



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 26
Rvalera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of drawings and specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written approval of the Building Official. The issuance of a permit or approval of plans, specifications and calculations shall not be construed to be a permit for, nor an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
1	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

PLUMBING ROOF PLAN

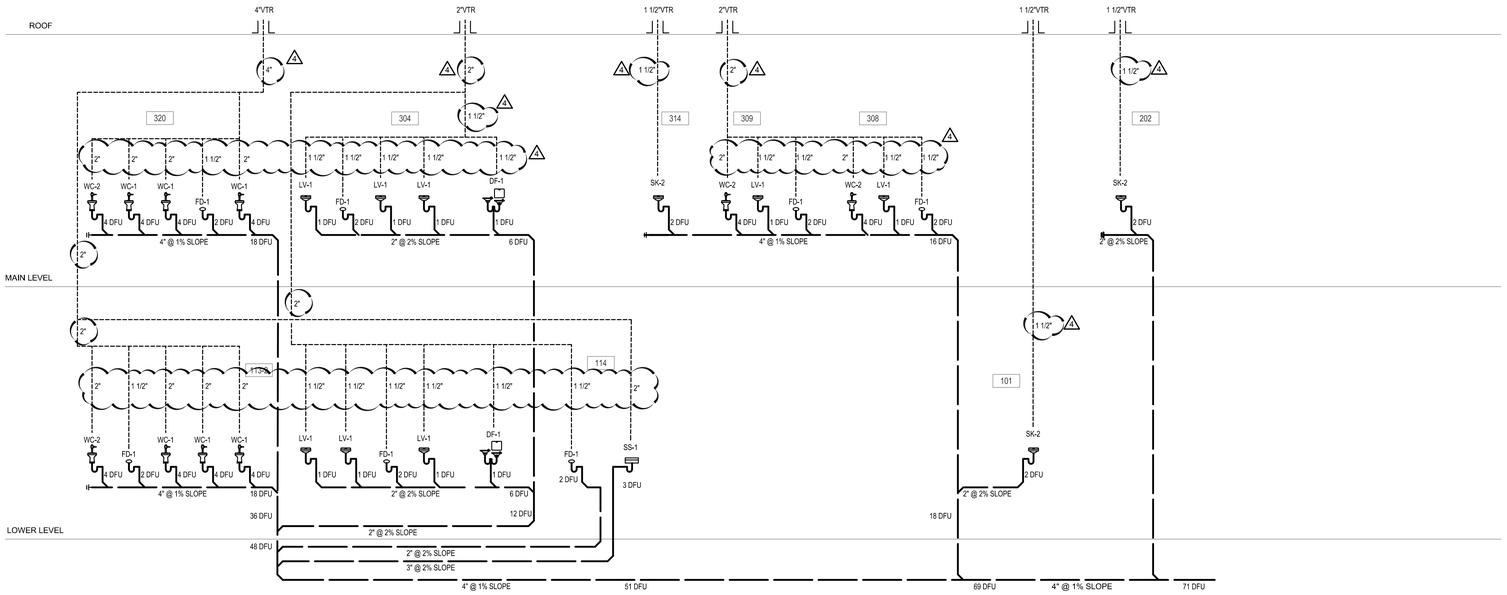
SCALE: 1/8" = 1'-0"

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

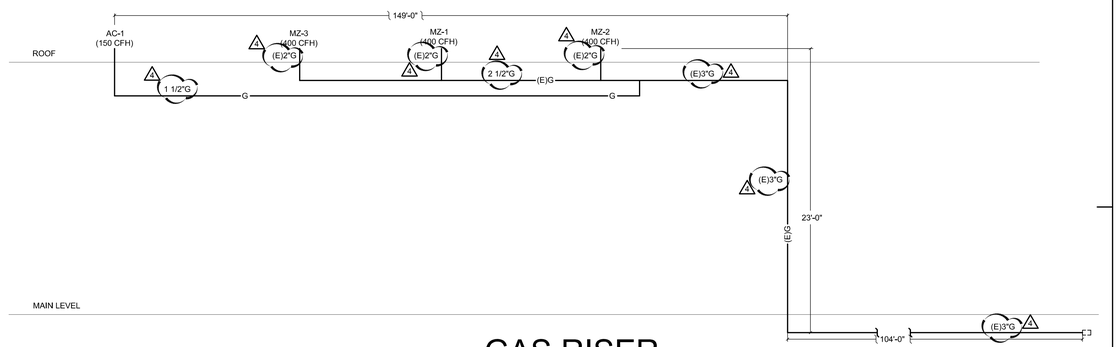
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P301

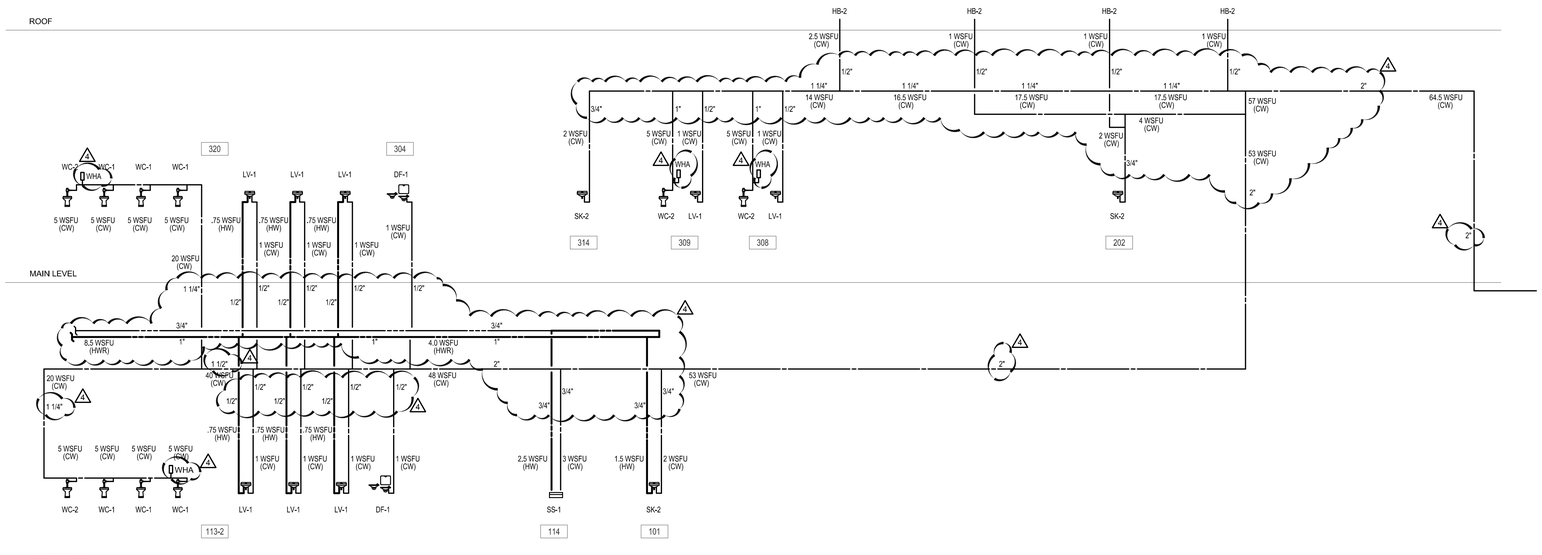
7/18/2025 4:46:16 PM



SEWER & VENT RISER



GAS RISER



HOT & COLD WATER RISER

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — JENNIFER G. MAI — No. M38752 — MECHANICAL — STATE OF CALIFORNIA

STAMP

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLE 26
Rvalera
PUBLIC WORKS
09/11/2025 1:38:39 PM
This set of drawings and specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations in these plans or specifications without the prior written approval of the Building Official. The issuance of a permit or approval of plans and specifications, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

PLUMBING RISER DIAGRAM

SCALE: NOT TO SCALE 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

P400

DCGR ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
PH.909.987.0017
Fax 909.980.7023

GENERAL NOTES

1. PROJECT RECORD DOCUMENTS. USE A COMPUTER AIDED DRAFTING (CAD) SYSTEM IN THE PREPARATION OF RECORD DRAWINGS FOR THIS PROJECT. ACCEPTABLE CAD SYSTEMS SHALL BE CAPABLE OF PRODUCING FILES COMPATIBLE WITH THE LATEST VERSION OF AUTOCAD IN DWG OR DXF FORMAT. OWNER'S CONSULTANT WILL FURNISH CAD BACKGROUNDS FOR USE BY THE CONTRACTOR AFTER CONSTRUCTION IS 90% COMPLETE EXCEPT WHERE PROHIBITED BY CONTRACT.

2. ALL ELECTRICAL PREFABRICATED EQUIPMENT SHALL BE DESIGNED AND CONSTRUCTED IN SUCH A MANNER THAT ALL PORTIONS, ELEMENTS, SUB-ASSEMBLIES AND/OR PARTS OF SAID EQUIPMENT, AND THE EQUIPMENT AS A WHOLE INCLUDING ITS ATTACHMENTS, WILL RESIST A LOAD WHICH EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE EQUIPMENT TO THE SUPPORTING STRUCTURE.

3. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED BY UNDERWRITER'S LABORATORIES (UL) AND BEAR THEIR LABEL, OR LISTED AND CERTIFIED BY A NATIONALLY RECOGNIZED TESTING AUTHORITY, WHERE UL DOES NOT HAVE A LISTING. CUSTOM MADE EQUIPMENT SHALL HAVE COMPLETE TEST DATA SUBMITTED BY THE MANUFACTURER ATTESTING TO ITS SAFETY. IN ADDITION, THE MATERIALS, EQUIPMENT, AND INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING:

   AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
   INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
   NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
   AMERICAN STANDARD ASSOCIATION (ASA)
   NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
   AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)
   CALIFORNIA ELECTRICAL CODE (CEC) - LATEST EDITION
   CALIFORNIA CODE OF REGULATIONS TITLE 24 (CCR)
   INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
   ALL LOCAL CODES HAVING JURISDICTION.

   WHERE THE CODES HAVE DIFFERENT LEVELS OF REQUIREMENTS, THE MOST STRINGENT RULE SHALL APPLY.

4. THE CONTRACTOR SHALL VISIT THE SITE INCLUDING ALL AREAS INDICATED ON THE DRAWINGS. HE SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AND BY SUBMITTING A BID, ACCEPTS THE CONDITIONS UNDER WHICH HE SHALL BE REQUIRED TO PERFORM HIS WORK.

5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A COMPLETE SET OF CONTRACT DOCUMENTS AND ADDENDA (DRAWINGS AND SPECIFICATIONS.) HE SHALL CHECK THE CONTRACT DOCUMENTS OF THE OTHER TRADES AND DETERMINE HIS RESPONSIBILITIES. FAILURE TO DO SO SHALL NOT RELEASE THE CONTRACTOR FROM COMPLETING ALL RESPONSIBLE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6. SECURE AND PAY FOR ALL PERMITS, FEES, CHARGES, AND INCIDENTAL COSTS NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK, INCLUDING ALL CHARGES BY STATE, COUNTY AND LOCAL GOVERNMENTAL AGENCIES.

7. ALL ELECTRICAL WORK REFERENCED HEREIN SHALL BE COORDINATED WITH OTHER TRADES AND SITE CONDITIONS. ANY COSTS TO INSTALL WORK TO ACCOMPLISH SAID COORDINATION WHICH DIFFERS FROM THE WORK AS SHOWN ON THE CONTRACT DOCUMENTS SHALL BE INCURRED BY THE CONTRACTOR. ANY DISCREPANCIES, AMBIGUITIES OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT DURING BID TIME FOR CLARIFICATION. ANY SUCH CONFLICTS NOT CLARIFIED PRIOR TO BID SHALL BE SUBJECT TO THE INTERPRETATION OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.

8. PROVIDE TEMPORARY POWER FACILITIES AND CONNECTIONS FOR ALL FEEDERS, BRANCH CIRCUITS, OR SIGNAL AND COMMUNICATIONS SYSTEMS BEING DISCONNECTED IN ORDER TO MAINTAIN SYSTEMS IN OPERATION.

9. ALL INTERRUPTION OF ELECTRICAL POWER SHALL BE KEPT TO A MINIMUM. HOWEVER, WHEN AN INTERRUPTION IS NECESSARY, THE SHUTDOWN MUST BE COORDINATED WITH THE OWNER AND ENGINEER 14 DAYS PRIOR TO THE OUTAGE. ANY OVERTIME PAY SHALL BE INCLUDED IN THE CONTRACTOR'S BID. WORK IN EXISTING SWITCHBOARDS OR PANELBOARDS SHALL BE COORDINATED WITH THE OWNER PRIOR TO REMOVING ACCESS PANELS OR DOORS.

10. AFTER ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE OWNERS WILL INSPECT THE WORK. THE CONTRACTOR SHALL PROVIDE COMPETENT PERSONNEL TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM TO THE FULL SATISFACTION OF EACH REPRESENTATIVE. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE OWNER AFTER RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.

11. FURNISH A ONE YEAR WRITTEN GUARANTEE OF MATERIALS AND WORKMANSHIP FROM THE DATE OF SUBSTANTIAL COMPLETION.

12. REVIEW AND COORDINATE WITH THE MECHANICAL, FIRE PROTECTION AND PLUMBING CONTRACT DOCUMENTS FOR DUCTS, LINES AND EQUIPMENT.

13. ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT SHALL BE MADE BY THE CONTRACTOR.

14. COORDINATE WITH OTHER TRADES AS TO THE EXACT LOCATION OF THEIR RESPECTIVE EQUIPMENT, SUPPLY POWER AND MAKE CONNECTION TO MOTORS AND EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS AS INDICATED ON THE SINGLE LINE DIAGRAM, ELECTRICAL DRAWINGS, AND DRAWINGS OF OTHER TRADES. REVIEW THE DRAWINGS OF OTHER TRADES FOR CONTROL DIAGRAMS, SIZE AND LOCATION OF EQUIPMENT. DISCONNECT SWITCHES, STARTERS, WIRING, CONTROLS, AND CONDUIT FOR MECHANICAL AND PLUMBING OPERATIONS SHALL BE PROVIDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING MANUFACTURER'S SHOP DRAWINGS PRIOR TO ROUGHING IN ALL CONDUIT TO THIS EQUIPMENT.

15. EXACT METHOD AND LOCATION OF CONDUIT PENETRATION AND OPENINGS IN CONCRETE OR MASONRY WALLS, GRADEBEAMS, FLOORS OR STRUCTURAL STEEL MEMBERS SHALL BE AS DIRECTED BY THE STRUCTURAL ENGINEER. PERFORM CORING, SAWCUTTING, PATCHING, AND REFINISHING OF WALLS AND SURFACES WHEREVER IT IS NECESSARY TO PENETRATE. OPENINGS SHALL BE SEALED IN AN APPROVED METHOD TO MEET THE FIRE RATING OF THE PARTICULAR WALL, FLOOR OR CEILING. EXACT METHOD AND LOCATIONS OF CONDUIT PENETRATIONS AND OPENINGS IN CONCRETE WALLS OR FLOORS SHALL BE UL APPROVED.

16. CONNECTIONS TO MECHANICAL, PLUMBING AND VIBRATING EQUIPMENT AND SEISMIC SEPARATIONS:

    LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN DRY INTERIOR LOCATIONS.

    LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN AREAS EXPOSED TO WEATHER, DAMP LOCATIONS, CONNECTIONS TO TRANSFORMER ENCLOSURES, AND FINAL CONNECTIONS TO MOTORS.

17. EQUIPMENT OUTLETS, LIGHTING FIXTURES, CONDUIT, WIRE, AND CONNECTION METHODS IN HVAC AIR-PLENUMS SHALL BE APPROVED FOR USE IN PLENUMS AND SHALL CONFORM TO THE CALIFORNIA ELECTRICAL CODE.

18. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILING SPACES PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT A NEAT APPEARANCE.

19. CONDUIT SHALL NOT BE INSTALLED IN ANY FLOOR SLAB. CONDUIT SHALL BE INSTALLED CONCEALED IN THE CEILING SPACE, CONCEALED IN WALLS, OR 24" MINIMUM BELOW SLAB ON GRADE UNLESS NOTED OTHERWISE.

20. LOCATE ELECTRICAL EQUIPMENT AND BOXES, IN ACCESSIBLE CEILING SPACE OR PROVIDE AN ACCESS PANEL FOR INACCESSIBLE CEILING SYSTEMS. ACCESS DOORS SHALL BE A MINIMUM DIMENSION OF 24"x24". ACCESS DOOR LOCATIONS SHALL SUIT ACCESSIBILITY AND CONSTRUCTION CONDITIONS. ACCESS DOORS SHALL HAVE A FIRE RATING EQUAL TO THE CEILING ASSEMBLY IN WHICH THEY ARE INSTALLED.

21. COORDINATE REQUIRED ACCESS DOORS IN NON-ACCESSIBLE CEILINGS TO SUIT FIELD CONDITIONS. THE EXACT SIZES AND PHYSICAL LOCATIONS SHALL SUIT ACCESSIBILITY AND CONSTRUCTION CONDITIONS. ACCESS DOORS SHALL BE PROVIDED IN OTHER SECTIONS OF THE SPECIFICATIONS. ACCESS DOORS SHALL HAVE A FIRE RATING EQUAL TO THE CEILING ASSEMBLY IN WHICH THEY ARE INSTALLED

22. WHENEVER A DISCREPANCY OF ANY SYSTEM AND/OR EQUIPMENT ARISES ON THE CONTRACT DOCUMENTS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR SPECIFICATIONS TO ENSURE COMPLETE AND OPERABLE SYSTEMS AS REQUIRED BY THE OWNER AND ARCHITECT/ENGINEER.

23. VERIFY TYPE OF CEILING SYSTEMS AND FURNISH APPROVED LIGHTING FIXTURES OF THE TYPE REQUIRED FOR MOUNTING IN THE SPECIFIC CEILING. WHERE FIXTURES ARE RECESSED IN PLASTER OR DRYWALL CEILINGS, THEY SHALL BE COMPLETE WITH NECESSARY MOUNTING HARDWARE AND PLASTER FRAMES.

24. ALL EQUIPMENT/DEVICES INSTALLED RECESSED IN FIRE RATED CEILINGS OR WALLS SHALL BE ENCLOSED WITH AN APPROVED UL LISTED ENCLOSURE CARRYING THE SAME FIRE RATING AS THE CEILING OR WALL.

25. UTILITY PENETRATIONS OF ANY KIND IN FIRE AND SMOKE PARTITIONS AND CEILING ASSEMBLIES. SHALL BE FIRESTOPPED AND SEALED WITH AN APPROVED UL LISTED SYSTEM OR MATERIAL.

    STEEL ELECTRICAL OUTLET BOXES WHICH DO NOT EXCEED 16 SQUARE INCHES IN AREA, NEED NOT BE PROTECTED IN ONE HOUR OR TWO HOUR FIRE RATED WALLS, PARTITIONS, CEILINGS, OR AREA SEPARATION UNLESS THEY:

    OCCUR ON OPPOSITE SIDES OF THE WALL WITHIN 24 INCH HORIZONTAL DISTANCE OF ONE ANOTHER. IN THIS CASE, ONLY ONE OUTLET BOX NEED TO PROTECTED BY AN APPROVED FIRESTOP MATERIAL OR DETAIL TO CORRECT THIS CONDITION.

    OCCUR IN COMBINATION WITH OUTLET BOXES OF ANY SIZE SUCH THAT THE AGGREGATE AREA OF UNPROTECTED OUTLET BOXES EXCEEDS 100 SQUARE INCHES IN ANY 100 SQUARE FEET OF WALL AREA. IN THIS CASE, ONLY A SUFFICIENT NUMBER OF OUTLET BOXES NEED BE PROTECTED BY AN APPROVED MATERIAL OR DETAIL TO REDUCE THE AGGREGATE AREA OF UNPROTECTED UTILITY BOXES TO LESS THAN 100 SQUARE INCHES IN ANY 100 SQUARE FEET OF WALL.

    STEEL ELECTRICAL OUTLET BOXES WHICH EXCEED 16 SQUARE INCHES IN AREA, AND ALL OTHER STEEL UTILITY OUTLET BOXES REGARDLESS OF SIZE, SHALL BE PROTECTED BY AN APPROVED FIRESTOP MATERIAL AS LISTED OR EQUAL.

    FIRESTOPPING MATERIAL: MPP-1 MOLDABLE PUTTY PADS

    3M CONTRACTOR PRODUCTS
    MINNEAPOLIS, MN
    3M TEST REPORT NO. 1167
    DATED AUGUST 21, 1987

    FSP FIRESTOP PUTTY PADS
    HEVI-DUTY NELSON PRODUCTS
    TULSA, OK

    FLAMESAFE FSP 1077 FIRESTOP PADS
    INTERNATIONAL PROTECTIVE COATINGS
    OAKHURST, NJ

    STEEL UTILITY BOXES WHICH EXCEED 100 SQUARE INCHES IN AREA SHALL BE PROTECTED BY ENCASEMENT.

    UTILITY AND ELECTRICAL OUTLETS OR BOXES SHALL BE SECURELY FASTENED TO THE STUD FRAMING OF THE WALL, PARTITION OR CEILING ASSEMBLY. THE OPENING IN THE GYPSUM BOARD FACING SHALL BE CUT SO THAT THE CLEARANCE BETWEEN THE BOX AND THE GYPSUM BOARD DOES NOT EXCEED 1/8 INCH. IN SMOKE WALLS OR PARTITIONS, THE 1/8 INCH CLEARANCE SHALL BE FILLED WITH AN APPROVED FIRE-RATED SEALANT.

26. ARCHITECTURAL REFLECTED CEILING PLANS INDICATING THE LOCATION OF LIGHTING FIXTURES SHALL TAKE PRECEDENCE OVER THE LOCATIONS OF SAME SHOWN ON THE ELECTRICAL DRAWINGS. INSTALL THE LIGHTING FIXTURES IN ANY GIVEN AREA PER THE ARCHITECTURAL REFLECTED CEILING PLANS. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

27. REFER TO SINGLE LINE DIAGRAM AND FEEDER SCHEDULES FOR CONDUIT AND CONDUCTOR SIZE TO PANELS, MECHANICAL AND PLUMBING EQUIPMENT, ETC. CONDUIT RUNS MAY NOT BE SHOWN ON DRAWINGS, BUT SHALL BE INCLUDED AS PART OF THIS CONTRACT.

28. STRAIGHT FEEDER, BRANCH CIRCUIT, AND CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES OR JUNCTION BOXES TO LIMIT THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 100 FEET. PULL BOXES SHALL BE SIZED PER CODE OR AS INDICATED ON DRAWINGS. LOCATIONS SHALL BE DETERMINED IN THE FIELD OR AS INDICATED ON THE DRAWINGS.

29. MAXIMUM QUANTITY OF CONDUCTORS IN AN OUTLET OR JUNCTION BOX SHALL CONFORM TO THE CALIFORNIA ELECTRICAL CODE, ARTICLE 314.16. IN NO CASE SHALL OUTLET OR JUNCTION BOXES CONTAIN MORE THAN THE FOLLOWING QUANTITY OF #12 AWG CONDUCTORS FOR THE SIZE OF BOX INDICATED. THE MINIMUM SIZE OUTLET OR JUNCTION BOX PERMITTED IN A WALL IS FOUR INCHES SQUARE BY 1-1/2 INCHES DEEP.

4" SQ. BY 1-1/2" D =	9 CONDUCTORS
4" SQ. BY 2-1/8" D =	13 CONDUCTORS
4-11/16" SQ. BY 1-1/2" D =	11 CONDUCTORS
4-11/16" SQ. BY 2-1/8" D =	18 CONDUCTORS

    ALL OUTLET BOXES CONTAINING MORE THAN ONE DEVICE SHALL BE GANGED. TWO DEVICES DOUBLE GANGED, MINIMUM.

30. WHERE MULTIPLE HOMERUNS ARE INDICATED ON DRAWINGS REFERENCING THE SAME PANELBOARD CIRCUIT NUMBER, PROVIDE JUNCTION BOX ABOVE ACCESSIBLE CEILING AND ROUTE ONE SET OF WIRES TO CIRCUIT BREAKERS.

31. THE LOCATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECTURAL ELEVATIONS, DETAILS, OR SECTIONS PRIOR TO INSTALLATION. ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE RECESSED IN WALLS UNLESS OTHERWISE NOTED. OUTLETS NOT INDICATED ON ARCHITECTURAL ELEVATIONS SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO ROUGH-IN. UNLESS OTHERWISE NOTED, ELECTRICAL DEVICES SHALL BE MOUNTED PER "ACCESSIBLE DEVICE MOUNTING HEIGHT" DETAIL.

    REVIEW ARCHITECTURAL ELEVATIONS OF CASEWORK-OUTLETS MOUNTED ABOVE OR BELOW, OR ADJACENT TO CASEWORK SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS, PRIOR TO FINAL ROUGH-IN. ELECTRICAL DRAWINGS SHALL GOVERN NUMBER AND TYPE OF OUTLETS; HOWEVER, LOCATIONS SHALL BE AS INDICATED ON ARCHITECTURAL ELEVATIONS. PROVIDE CONDUIT, WIRES, AND OUTLETS FOR WORK REQUIRED IN CASEWORK INSTALLATIONS. REFERENCE ARCHITECTURAL DETAILS FOR METHOD OF ROUTING CONDUIT WITHIN CASEWORK CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CUT-OUTS IN TILE OR COUNTER SPLASHES WHERE RECEPTACLES, OUTLETS, ETC., OCCUR. PROVIDE BOX EXTENSIONS THROUGH ALL CASEWORK TO ENSURE FINISHED INSTALLATION IS FLUSH WITH FACE OF SPLASH, CABINET, ETC.

    MOUNTING HEIGHTS OF ALL DEVICES AND EQUIPMENT ARE FROM FINISHED FLOOR TO CENTER OF DEVICES AND EQUIPMENT UNLESS OTHERWISE NOTED.

    BOXES INSTALLED IN LOCATIONS NOT APPROVED BY THE ARCHITECT SHALL BE RELOCATED AS DIRECTED BY THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.

32. DRAWINGS ARE DIAGRAMMATIC AND DO NOT INDICATE DETAILED CONDUIT ROUTING OR LENGTHS REQUIRED FOR COMPLETE INSTALLATION. ROUTING OF RACEWAYS SHALL BE AT THE OPTION OF THE CONTRACTOR BUT SHALL BE IN STRICT COMPLIANCE WITH STRUCTURAL REQUIREMENTS, CONTRACT DOCUMENTS AND SPECS UNLESS OTHERWISE NOTED. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES. DO NOT SCALE THE ELECTRICAL DRAWINGS FOR LOCATIONS OF ANY ELECTRICAL, ARCHITECTURAL, STRUCTURAL AND/OR MECHANICAL ITEMS OR FEATURES. REFER TO ARCHITECTURAL AND STRUCTURAL CONTRACT DOCUMENTS FOR DIMENSIONS.

33. A PROPERLY SIZED EQUIPMENT GROUNDING CONDUCTOR, ALTHOUGH NOT SHOWN ON CONDUIT RUNS, SHALL BE INSTALLED AND RUN CONTINUOUS FROM PANEL TO THE LAST DEVICE. THIS WIRE SHALL BE PIGTAILED IN EACH OUTLET FOR CONNECTION TO BOX AND DEVICE SUCH THAT IF DEVICE IS REMOVED THE CONTINUITY OF THE GROUND WILL NOT BE COMPROMISED/INTERRUPTED. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSULATED GREEN CONDUCTORS - ALTERNATE METHODS OF IDENTIFICATION SHALL NOT BE USED. CONTRACTOR SHALL NOTIFY ELECTRICAL ENGINEER TO EXAMINE CONDUCTOR INSTALLATION PRIOR TO INSTALLATION OF DEVICES.

34. ALL CONDUCTORS SHALL BE UL LISTED COPPER #12 AWG MINIMUM SIZE, TYPE THHN/THWN THERMOPLASTIC, 600 VOLT, 75 DEGREES CELSIUS WET AND 90 DEGREES CELSIUS DRY AND UL LISTED UNLESS NOTED OTHERWISE. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.

35. PANEL SCHEDULES SHALL BE REVISED TO REFLECT FINAL ROOM NAMES AND NUMBERS USING OWNERS ROOM NAMES AND NUMBERS DESIGNATIONS.

36. WHERE OUTLETS OCCUR AT TACKABLE WALL PANELS OR OTHER WALL FINISHES, PROVIDE EXTENSION RINGS AS REQUIRED SO THAT NO SPACE WILL EXIST BETWEEN DEVICE PLATE AND BACKBOX, PER CALIFORNIA ELECTRICAL CODE 314.20. SEE ARCHITECTURAL ELEVATIONS FOR WALL FINISHES AND LOCATIONS.

37. COORDINATE LOCATIONS OF ALL SEISMIC SEPARATIONS.

38. ALL ELECTRICAL WORK SHALL BE DESIGNED PER 2023 LOS ANGELES COUNTY ELECTRICAL CODE, 2022 CALIFORNIA ELECTRICAL CODE, AND 2020 NATIONAL ELECTRICAL CODE.

39. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION.

40. THE MAXIMUM COMBINED VOLTAGE DROP ON BOTH INSTALLED FEEDER CONDUCTORS AND BRANCH CIRCUIT CONDUCTORS TO THE FARTHEST CONNECTED LOAD OR OUTLET SHALL NOT EXCEED 5 PERCENT.

⚠

EQUIPMENT ANCHORAGE NOTES

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE AGENCY APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC, SECTIONS 1616A.1.18 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTER 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
3. MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT THE ATTACHMENT NEED NOT BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.8, 13.6.7, 13.6.5.6, AND 2022 CBC, SECTIONS 1616A.1.23, 1616A.1.24, 1616A.1.25 AND 1616A.1.26.

COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF HANGING AND BRACING OF THE PIPE, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS.

THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

DEMOLITION NOTES

1. IN GENERAL, THE DEMOLITION PLAN INDICATES ALL EXISTING EQUIPMENT TO BE REMOVED; HOWEVER, ELECTRICAL EQUIPMENT, WHETHER SHOWN ON THIS DRAWING OR NOT, THAT IS LOCATED IN REMOVED WALLS, FLOORS OR CEILINGS, SHALL BE REMOVED/RELOCATED UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL VISIT THE SITE AND ALL AREAS INCLUDED IN THE DRAWINGS. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH THESE EXISTING CONDITIONS, AND BY SUBMITTING A BID ACCEPTS CONDITIONS UNDER WHICH THE CONTRACTOR WILL BE REQUIRED TO PERFORM HIS WORK.
3. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO DISCONNECT AND REMOVE ALL EXISTING LIGHTING FIXTURES, RECEPTACLES, ELECTRICAL EQUIPMENT, ETC., AFFECTED BY THE REMODELED AREA. THIS WILL INCLUDE REROUTING, OR THE EXTENSION OF EXISTING CONDUIT AND FEEDERS WHERE NECESSARY TO MAINTAIN THE CONTINUITY OF EQUIPMENT TO REMAIN.
4. ALL CIRCUIT NUMBERS AND EXISTING CONDUIT HOMERUNS SHOWN ON THESE DRAWINGS WERE TAKEN FROM EXISTING RECORD DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATIONS OF HOMERUNS, AND ADJUST CIRCUIT NUMBERS ACCORDING TO EXISTING CONDITIONS AS REQUIRED.
5. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS, EQUIPMENT, ETC., REMAINING IN OPERATION WHICH ARE BEING FED BY AN ABANDONED OUTLET. MAINTAINING CONTINUITY SHALL CONSIST OF REROUTING CONDUIT, WIRING, ETC., AS REQUIRED.
6. ALL ELECTRICAL FIXTURES, OUTLETS, DEVICES, ETC., THAT ARE REMOVED SHALL BE REMOVED COMPLETELY, INCLUDING CONDUIT AND WIRING BACK TO THE LAST FIXTURE, OUTLET, DEVICE, ETC., REMAINING IN SERVICE.
7. EXISTING CIRCUITS WHICH ARE REMOVED AND NOT REUSED SHALL BE IDENTIFIED ON THE PANEL SCHEDULE AS "SPARE".
8. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO REMOVAL OF EXISTING ELECTRICAL EQUIPMENT AND CONDUCTORS. CONTRACTOR SHALL TURN OVER REMOVED EQUIPMENT THAT THE OWNER REQUESTS IN AN "AS-FOUND" CONDITION. EQUIPMENT THAT IS TO BE TURNED OVER SHALL BE BOXED AND TAGGED TO IDENTIFY THE SPECIFIC EQUIPMENT.
9. WHERE NEW CIRCUITS ARE SHOWN TO EXISTING PANELS, INSTALL NEW BREAKERS (MINIMUM 20 AMP, SINGLE POLE) AS REFERENCED ON DRAWINGS. IDENTIFY EACH NEW CIRCUIT ON THE ASSOCIATED PANEL SCHEDULE DIRECTORY.
10. EXISTING CONDUIT MAY BE REUSED IF ADEQUATELY SIZED, BUT IN NO CASE SHALL ANY EXISTING CONDUCTORS BE REUSED.
11. IN SOME INSTANCES, IT MAY BE NECESSARY FOR THE ELECTRICAL CONTRACTOR TO TEMPORARILY RELOCATE, REROUTE, ETC., EXISTING ELECTRICAL EQUIPMENT. THIS SHALL BE DONE SO THAT THE SYSTEMS IN ALL PHASES (THOSE COMPLETED AND THOSE YET TO BEGIN), ARE IN COMPLETE, OPERABLE, CONDITION AS CONSTRUCTION PROCEEDS THROUGH EACH PHASE
12. WHERE NEW CIRCUITS ARE SHOWN CROSSING PHASING BOUNDARIES THE CONTRACTOR SHALL CONNECT ALL EQUIPMENT, FIXTURES, ETC., IN THE PHASE WHICH IS THEN UNDER CONSTRUCTION. CONTRACTOR SHALL STUB-OUT ALL REQUIRED CONDUIT AND WIRING ACROSS PHASE BOUNDARIES, THEN PICK UP AND EXTEND THESE CONDUIT RUNS WHEN CONSTRUCTION BEGINS IN THE ADJACENT PHASE.
13. DURING EACH PHASE OF DEMOLITION, ALL CIRCUITS FROM EXISTING PANELS WHICH FEED AREAS OUTSIDE THE BOUNDARIES OF THAT PHASE, SHALL BE MAINTAINED.
14. ALL DEVICES REMOVED TO ACCOMPLISH DEMOLITION WORK SHALL BE REINSTALLED SIMILAR TO NEW WORK.
15. DO NOT REMOVE EXISTING FIRE ALARM DEVICES OR EQUIPMENT UNTIL NEW FIRE ALARM SYSTEM HAS BEEN, INSTALLED, TESTED, APPROVED AND ACCEPTED BY THE LOCAL FIRE AUTHORITY IN INSTANCES EXISTING FIRE ALARM DEVICES ARE REMOVED PRIOR TO ACCEPTANCE BY THE AHS(S). A FIRE WATCH IS REQUIRED WHENEVER THE BUILDING (WHOLE OR PARTIAL) IS OCCUPIED. CFC ART 87. EXISTING FIRE ALARM DEVICE SHALL NOT BE ABANDON IN PLACE PER CEC 820.53(3)(D).
16. THE CONTRACTOR SHALL PROVIDE STAINLESS STEEL COVER PLATE ON ALL BACK BOXES TO REMAIN WHERE OPENINGS HAVE BEEN CREATED BY REMOVED DEVICES TO COMPLY WITH CEC 314.25.

FIRE ALARM DEFERRED APPROVAL NOTES

THE FIRE ALARM SYSTEM WORK SHALL NOT BE STARTED UNTIL THE DETAILED DRAWINGS, SPECIFICATIONS, AND ENGINEERING CALCULATIONS HAVE BEEN ACCEPTED AND SIGNED BY THE ENGINEER OF RECORD WHO HAS DELEGATED RESPONSIBILITY COVERING THE WORK SHOWN ON THE DRAWINGS AND SPECIFICATION.

THE FIRE ALARM SYSTEM SHALL MEET THE CONTRACT DOCUMENT REQUIREMENTS. FIRE ALARM SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT WITHIN 7 CALENDAR DAYS AFTER NOTICE TO PROCEED. THE FIRE ALARM SHOP DRAWINGS SHALL CONTAIN THE FOLLOWING INFORMATION:

1. A FIRE ALARM SYSTEM IS REQUIRED IN ACCORDANCE WITH CCR, TITLE 24, AND SHALL CONFORM TO CCR, PART 3, TITLE 24, ARTICLE 760.
2. INDICATE WHAT TYPE OF FIRE ALARM SYSTEM IS BEING PROVIDED IN ACCORDANCE WITH CCR, PART 3, TITLE 24, SEC. 760-1.
3. PROVIDE CATALOG DATA, CSFM LISTING NUMBER, AND MODEL NUMBER FOR EVERY FIRE ALARM SYSTEM COMPONENT.
4. PROVIDE SINGLE LINE, RISER, AND POINT-TO-POINT WIRING DIAGRAMS.
5. AN EMERGENCY WARNING SYSTEM WITH VISUAL STROBE DEVICES IS REQUIRED FOR THE HEARING IMPAIRED, CCR, TITLE 24.
6. INDICATE THE CONDUIT SIZES, QUANTITY AND TYPE OF CONDUCTORS, AND WHETHER THE SYSTEM IS POWER LIMITED OR NON-POWER LIMITED.
7. PROVIDE BATTERY CALCULATIONS FOR THE ENTIRE SYSTEM (24 HOUR STANDBY, 5 MINUTE ALARM TIME).
8. PROVIDE FLOOR PLANS SHOWING LOCATIONS OF ALL FIRE ALARM EQUIPMENT. INTERCONNECT WIRING, REMOTE POWER SUPPLIES, AND ANNUNCIATORS.
9. PROVIDE VOLTAGE DROP CALCULATIONS FOR ALL SIGNAL CIRCUITS.

SHEET INDEX

SHEET	DESCRIPTION
E001	ELECTRICAL GENERAL NOTES
E002	ELECTRICAL SYMBOLS LIST AND ABBREVIATIONS
E003	LIGHTING FIXTURE SCHEDULE
E004	SINGLE LINE DIAGRAM AND FEEDER SCHEDULE

ELECTRICAL ABBREVIATIONS

AF	AMPERE FUSE RATING
AFF	ABOVE FINISHED FLOOR
AIC	AMPS INTERRUPTED CAPACITY RATING (RMS SYMMETRICAL MINIMUM)
AM	AMMETER
AMP, A	AMPERES
APPR	APPROVED
AS	AMPERE SWITCH RATING
AT	AMPERE TRIP RATING OR BREAKER
AUTO	AUTOMATIC
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BRD, BD	BOARD
BFC	BELOW FINISHED CEILING
BKR	BREAKER
C,	CONDUIT
CAB	CABINET
CAT	CATEGORY
CC	CENTER TO CENTER
cd	CANDELA
CHLOR	CHLORINE, CHLORINATION
CKT	CIRCUIT
CMH	COMMUNICATION MANHOLE
C.O.	CONDUIT ONLY
COMPT	COMPARTMENT
COMPR	COMPRESSOR
CPB	COMMUNICATION PULLBOX
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY (MAGNETICALLY HELD U.N.O.)
CSFM	CALIFORNIA STATE FIRE MARSHALL
CT	CURRENT TRANSFORMER
CU	COPPER
D.C.A.	DETECTOR CHECK ASSEMBLY
DISC.	DISCONNECT
DISTR	DISTRIBUTION
DWG	DRAWING
ELEV	ELEVATION
EMERG, EM	EMERGENCY
ENCL	ENCLOSURE
EQPT	EQUIPMENT
EXH	EXHAUST
E	EXISTING
FAA	FIRE ALARM ANNUNCIATOR
FDR	FEEDER
FF	FINISHED FLOOR
FG	FINISHED GRADE
FS	FLOW SWITCH
FLEX	FLEXIBLE
FLUOR	FLUORESCENT
FOC	FIBER OPTIC CABLE
FUT	FUTURE
FUP	FUSE, CPT PRIMARY
FUS	FUSE, CPT SECONDARY
GND, GRD,G	GROUND
HH	HAND HOLE
HOA	HAND-OFF-AUTOMATIC
HTR	HEATER
HZ	HERTZ
IDF	INTERMEDIATE DISTRIBUTION FRAME
ICPB	INTERCEPT COMMUNICATION PULLBOX
INC	INCANDESCENT
IND	INDICATION
INSTR	INSTRUMENT
IPPB	INTERCEPT POWER PULLBOX
ISC	SHORT CIRCUIT CURRENT
J.B.	JUNCTION BOX
K	THOUSAND (KILO)
KV	KILOVOLTS
KW	KILOWATTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KWH	KILOWATT HOURS
KWHD	KILOWATT HOUR DEMAND METER
LCP	LIGHTING CONTROL PANEL
LOS	PUSH BUTTON WITH "LOCK-OUT-STOP"
LS	LIMIT SWITCH
LT, LTS	LIGHT, LIGHTS
LTG	LIGHTING
LV	LOW VOLTAGE
MA	MILLIAMPS
MAN	MANUAL
MAG	MAGNETIC
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MDF	MAIN DISTRIBUTION FRAME
MH	MANHOLE
MS	MANUAL MOTOR STARTER
MIN	MINUTES, MINIMUM
MOV	MOTOR OPERATED VALVE, METAL OXIDE VARISTER
MT, MTD, MTG	MOUNT, MOUNTED, MOUNTING
N.A.P.	NEUTRALIZATION ALARM PANEL
NO, NOS	NUMBER, NUMBERS
NP	NAMEPLATE
NTS	NOT TO SCALE
OC	ON CENTER
OL	OVERLOAD
PB	PULLBOX
PIV	POST INDICATOR VALVE
PMH	POWER MANHOLE
PNL	PANEL
PNLBD	PANELBOARD
POS	POSITION
PPB	POWER PULLBOX
PRI	PRIMARY
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PW	PART WINDING
PWR	POWER
REC	RECEPTACLE
RECPTS	RECEPTACLES
REQD	REQUIRED
SA	STATUS ANNUNCIATOR
SCH	SCHEDULE
SEC	SECONDS, SECONDARY
SECT	SECTION
SEL SW	SELECTOR SWITCH
SEQ	SEQUENCE
SHLD	SHIELDED
SHT	SHEET
SIG	SIGNAL
SM	START CONTACTOR COIL
SPECS	SPECIFICATIONS
SP HTR	SPACE HEATER
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STR	STARTER
SV	SOLENOID VALVE
SW	SWITCH
SYS	SYSTEM
TACH	TACHOMETER
TC	TIME-CLOCK
TDOD	TIME DELAY ON DE-ENERGIZATION
TDOE	TIME DELAY ON ENERGIZATION
TEMP	TEMPERATURE
TERM	TERMINAL
THERM	THERMOSTAT
TR	TIME DELAY RELAY
TS	TAMPER SWITCH
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
UGPS	UNDERGROUND PULL SECTION
UTP	UNSHIELDED TWISTED PAIR
VFD	VARIABLE FREQUENCY DRIVE
V	VOLTS
VM	VOLTMETER
VS	VOLTMETER SWITCH
W	WATTS
WHM	WATT HOUR METER
WP	WEATHERPROOF
WPL	WEATHERPROOF LOCKING
XFMR	TRANSFORMER
XMTR	TRANSMITTER

ELECTRICAL SYMBOLS LIST

S3 / Sa — SWITCH. LOWER CASE LETTER AT BOTTOM INDICATES OUTLETS CONTROLLED. CAPITAL SUPERSCRIPT INDICATES SWITCH TYPE. MOUNT PER DETAIL #1 ON E0.1 U.N.O.

NO SUPERSCRIPT	-	SINGLE POLE SWITCH
2	-	DOUBLE POLE
3	-	THREE WAY
4	-	FOUR WAY
I	-	ILLUMINATED HANDLE
K	-	KEYED SWITCH
LC	-	LOCKABLE COVER
M	-	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD PROTECTION
MC	-	MOMENTARY CONTACT
P	-	PILOT LIGHT
PR	-	PRESS TYPE
TP	-	THREE POSITION
T	-	TIMER-0-4 HR ROTARY WITH HOLD-ON FEATURE
L	-	LOCKABLE POSITION TOGGLE SWITCH

MS-1 — FEEDER DESIGNATION. SEE SINGLE LINE DIAGRAM, FEEDER SCHEDULES AND ELECTRICAL SITE PLAN.

DUPLEX GROUNDING TYPE RECEPTACLE. 20 AMP, 125 VOLT, 2 POLE, 3 WIRE. MOUNT PER DETAIL #1 ON E0.1 U.N.O. "TV" ADJACENT INDICATES MOUNTING OF RECEPTACLE AT +96". COORDINATE LOCATIONS WITH SIGNAL DRAWINGS. "C" ADJACENT SYMBOL INDICATES DEVICE MOUNTED ON CEILING TYPICAL UNLESS NOTED OTHERWISE.

DUPLEX GROUNDING TYPE CONTROLLED RECEPTACLE, 20AMP, 125 VOLT, 2 POLE, 3 WIRE. MOUNT PER DETAIL #1/E0.1 U.N.O. RECEPTACLE SHALL HAVE PERMANENT IDENTIFICATION. 2

DUPLEX GROUND FAULT INTERRUPTING TYPE RECEPTACLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE. MOUNT PER DETAIL #1 ON E0.1 U.N.O. "WPL" ADJACENT INDICATES WEATHER RESISTANT RECEPTACLE WITH EXTRA DUTY STAINLESS STEEL LOCKING COVER.

FLUSH FLOOR MOUNTED DUPLEX GROUNDING TYPE RECEPTACLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE IN SPECIAL FLOOR BOX.

DUPLEX GROUNDING TYPE RECEPTACLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE. MOUNT ABOVE COUNTER PER DETAIL #1 ON E0.1 U.N.O.

DUPLEX GROUND FAULT INTERRUPTING TYPE RECEPTACLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE. MOUNT ABOVE COUNTER PER DETAIL #1 ON E0.1 U.N.O.

TWO DUPLEX GROUNDING TYPE RECEPTACLES IN 4S BOX, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE. MOUNT PER DETAIL #1 ON E0.1 U.N.O.

TWO DUPLEX GROUND FAULT INTERRUPTING TYPE RECEPTACLES IN 3-GANG BOX WITH 2-GANG RING AND PLATE. 20A., 125 VOLT, 2 POLE, 3 WIRE. MOUNT PER DETAIL #1 ON E0.1 U.N.O.

TWO 20 AMP DUPLEX RECEPTACLES IN SPECIAL FLOOR BOX.

A L — SPECIAL PURPOSE OUTLET MOUNTED IN FLUSH WALL BOX. LETTER INDICATES TYPE. "L" ADJACENT INDICATES TWIST LOCK TYPE

A	-	NEMA TYPE 5-30R (125 VOLT, 1 PHASE, 30 AMP)
B	-	NEMA TYPE 5-50R (125 VOLT, 1 PHASE, 50 AMP)
C	-	NEMA TYPE 6-20R (250 VOLT, 1 PHASE, 20 AMP)
D	-	NEMA TYPE 6-30R (250 VOLT, 1 PHASE, 30 AMP)
E	-	NEMA TYPE 6-50R (250 VOLT, 1 PHASE, 50 AMP)
F	-	NEMA TYPE 11-20R (250 VOLT, 3 PHASE, 20 AMP)
G	-	NEMA TYPE 11-30R (250 VOLT, 3 PHASE, 30 AMP)
H	-	NEMA TYPE 11-50R (250 VOLT, 3 PHASE, 50 AMP)
J	-	NEMA TYPE 14-20R (125/250 VOLT, 1 PHASE, 20 AMP)
K	-	NEMA TYPE 14-30R (125/250 VOLT, 1 PHASE, 30 AMP)
M	-	NEMA TYPE 14-50R (125/250 VOLT, 1 PHASE, 50 AMP)
N	-	NEMA TYPE L22-30R (480 VOLT, 3 PHASE)

100AS — NON-FUSED DISCONNECT SWITCH. "AS" INDICATES SWITCH AMPERE RATING UNLESS NOTED OTHERWISE ON DRAWINGS.

F — FUSED DISCONNECT SWITCH. "AS" INDICATES SWITCH AMPERE RATING. "AF" INDICATES FUSE AMPERE RATING.

VFD II — MAGNETIC MOTOR STARTER. ROMAN NUMERAL INDICATES NEMA STARTER SIZE. ADDITIONAL SUBSCRIPTS INDICATE STARTER TYPE AND SIZE. (TYPICAL FOR ALL MAGNETIC STARTER SYMBOLS.)

NO SUBSCRIPT	-	FULL VOLTAGE, NON REVERSING
PR	-	PRIMARY RESISTOR REDUCED VOLTAGE
AT	-	AUTOTRANSFORMER REDUCED VOLTAGE
WD	-	WYE-DELTA REDUCED VOLTAGE
PW	-	PART WINDING REDUCED VOLTAGE
SS	-	SOLID STATE REDUCED VOLTAGE
REV	-	REVERSING TYPE
2S	-	TWO SPEED
2W	-	TWO WINDINGS
CH	-	CONSTANT HORSEPOWER
CT	-	CONSTANT TORQUE
VT	-	VARIABLE TORQUE
VFD	-	VARIABLE FREQUENCY DRIVE

COMBINATION MAGNETIC MOTOR STARTER AND NON-FUSED DISCONNECT SWITCH. TYPE AS INDICATED ABOVE.

F II — COMBINATION MAGNETIC MOTOR STARTER AND FUSED DISCONNECT SWITCH. TYPE AS INDICATED ABOVE.

SINGLE PHASE FRACTIONAL OR INTEGRAL HORSEPOWER

DUPLEX ISOLATED GROUNDING TYPE RECEPTACLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE WITH SEPARATE GROUND WIRE ROUTED TO PANEL AND CONNECTED TO ISOLATED GROUND BUS. DEVICE TO BE ORANGE IN COLOR. MOUNT PER DETAIL #1 ON E0.1 U.N.O.. COORDINATE LOCATIONS WITH SIGNAL DRAWINGS.

DUPLEX ISOLATED GROUNDING TYPE RECEPTACLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE WITH SEPARATE GROUND WIRE ROUTED TO PANEL AND CONNECTED TO ISOLATED GROUND BUS. DEVICE TO BE ORANGE IN COLOR. MOUNT PER DETAIL #1 ON E0.1 U.N.O. COORDINATE LOCATIONS WITH SIGNAL DRAWINGS. DEVICE IS TO BE CEILING MOUNTED.

TWO (2) DUPLEX ISOLATED GROUNDING TYPE RECEPTACLES, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE WITH SEPARATE GROUND WIRE ROUTED TO PANEL AND CONNECTED TO ISOLATED GROUND BUS. DEVICE TO BE ORANGE IN COLOR. MOUNT PER DETAIL #1 ON E0.1 U.N.O. COORDINATE LOCATIONS WITH SIGNAL DRAWINGS. DEVICE IS TO BE CEILING MOUNTED.

D 4a — DIGITAL WALL SWITCH WITH "ON/OFF" AND DIMMING CAPABILITY. REFER TO DETAIL #3/E4.01 FOR MANUFACTURERS AND MODEL NUMBERS. NUMERAL ADJACENT INDICATES QUANTITY OF BUTTONS. LOWER CASE LETTER AT BOTTOM INDICATES FIXTURES CONTROLLER. MOUNT AT +48" PER DETAIL #1/E0.1.

S — WALL MOUNTED INFRARED/ULTRASONIC OCCUPANCY SENSOR SWITCH/DIMMER. MOUNT AT +48". SENSOR SWITCH #WSX-PDT-D OR APPROVED EQUAL.

OS — INFRARED/ULTRASONIC DUAL TECHNOLOGY TYPE DIGITAL OCCUPANCY SENSOR COMPLETE WITH ALL POWER SUPPLIES, RELAY PACKS AND CONNECTIONS. REFER TO DETAIL #3/E4.01 FOR MANUFACTURE AND MODEL NUMBER.

RL a — DIGITAL ROOM CONTROLLER/POWER PACK WITH 0-10 VOLT DIMMING AND CAT5 CABLE CONNECTIONS. REFER TO DETAIL #3/E4.01 FOR MANUFACTURERS AND MODEL NUMBERS. LOWER CASE LETTER ADJACENT INDICATES LIGHT FIXTURES CONTROLLED.

PC a — DIGITAL PHOTOCELL. REFER TO DETAIL #3/E4.01 FOR MANUFACTURE AND MODEL NUMBER. LOWER CASE LETTER ADJACENT INDICATES LIGHT FIXTURES CONTROLLED.

PL A-1 — DIGITAL RECEPTACLE CONTROLLER WITH 20AMP RATED RELAY AND CAT5 CABLE CONNECTIONS. REFER TO DETAIL #3/E4.01 FOR MANUFACTURE AND MODEL NUMBERS. CIRCUIT ADJACENT SYMBOLS INDICATES CIRCUIT TO BE CONTROLLED.

(E) — EQUIPMENT WITH "E" ADJACENT IS EXISTING TO REMAIN.

(R) — EXISTING EQUIPMENT WITH "R" ADJACENT IS TO BE COMPLETELY DISCONNECTED AND REMOVED.

(RR) — EXISTING EQUIPMENT WITH "RR" ADJACENT IS TO BE DISCONNECTED AND REMOVED AND RELOCATED TO NEW LOCATION AND RECONNECTED AS REQUIRED.

(ER) — RELOCATED EQUIPMENT SHOWN IN NEW LOCATION.

—E— EXISTING CONDUIT RUN TO REMAIN. EXISTING CONDUCTORS TO REMAIN UNLESS NOTED OTHERWISE ON DRAWINGS.

—EA— EXISTING CONDUIT RUN TO BE ABANDONED. REMOVE CONDUCTORS AND CAP ENDS OF CONDUIT.

—EX— EXISTING CONDUIT RUN TO BE REWIRED. REFER TO PLANS FOR WIRING REQUIREMENTS.

—R— EXISTING CONDUIT AND WIRE RUN TO BE COMPLETELY DISCONNECTED AND REMOVED BACK TO LAST REMAINING OUTLET OR DEVICE.

—R—X—E— "X" INDICATES APPROXIMATE POINT OF INTERCEPTION OF EXISTING CONDUIT RUN. CONDUIT TO BE REMOVED AT "R" SIDE OF "X". REMOVE ALL CONDUCTORS PRIOR TO CUTTING CONDUIT. EXACT LOCATION OF ALL CONDUITS SHALL BE FIELD VERIFIED.

CONDUIT RUN CONCEALED IN WALLS OR UNDER FLOORS.

CONDUIT RUN EXPOSED.

CONDUIT RUN UNDERGROUND.

CONDUIT STUBBED OUT AND CAPPED. PULL LINE IN PLACE.

CROSS LINES ON CONDUIT RUNS INDICATE NUMBER OF #12 CURRENT CARRYING CONDUCTORS CONTAINED THEREIN. TWO #12 AND MINIMUM OF ONE #12 GROUND WIRE ARE INDICATED WHEN CROSS LINES ARE NOT SHOWN. NUMERALS ADJACENT TO CROSS LINES ON CONDUIT RUNS INDICATE SIZE OF CONDUCTORS IN LIEU OF #12. ALL CONDUITS SHALL CONTAIN ONE GROUND WIRE SIZED PER C.E.C. TABLE 250.122. BUT NOT SMALLER THAN #12. WHERE ISOLATED GROUND RECEPTACLES ARE INDICATED, PROVIDE ADDITIONAL #12 GROUND WIRE IN CONDUIT RUNS. CONNECTED FROM ISOLATED GROUND BUS IN PANEL TO DEVICE.

B-1,3 — CONDUIT HOMERUN TO PANELBOARD. LETTER AND NUMERALS INDICATE ELECTRICAL PANEL AND CIRCUIT NUMBER.

SURFACE MOUNTED BRANCH CIRCUIT PANELBOARD.

RECESSED BRANCH CIRCUIT PANELBOARD.

PNL — PANEL DESIGNATION.

SURFACE MOUNTED COMMUNICATION TERMINAL CABINET. REFER TO DRAWINGS AND SPECIFICATIONS.

RECESSED COMMUNICATION TERMINAL CABINET. REFER TO DRAWINGS AND SPECIFICATIONS.

J — JUNCTION BOX IN ACCESSIBLE CEILING SPACE OR FLUSH IN WALL WITH BLANK COVER PLATE TO MATCH DEVICE PLATES.

J — JUNCTION BOX FLUSH FLOOR MOUNTED.

J — JUNCTION BOX PEDESTAL TYPE FLOOR MOUNTED.

M — THREE PHASE FRACTIONAL OR INTEGRAL HORSEPOWER MOTOR. NUMERAL IN PLACE OF "M" INDICATES HORSEPOWER. (SINGLE LINE DIAGRAM ONLY).

100AF 100AT 3P — MOLDED CASE CIRCUIT BREAKER AND NUMBER OF POLES AS INDICATED. "AT" INDICATES TRIP RATING. "AF" INDICATES AMPERE FRAME SIZE. SUBSCRIPT INDICATES TYPE.

NO SUBSCRIPT	THERMAL MAGNETIC
NA	NON-AUTOMATIC
MO	MAGNETIC ONLY
CL	CURRENT LIMITING
SS	SOLID STATE

100AS 90AF 3P — FUSED SWITCH. "AS" INDICATES AMPERE SWITCH RATING, "AF" INDICATES AMPERE FUSE RATING, NUMBER OF POLES AS INDICATED.

ENCLOSED VOLTAGE TRANSFORMER PER SPEC'S. COPPER WOUND, DRY TYPE, U.N.O.

M — UTILITY METER SOCKET, WITH C.T.'S, CLIPS, ETC., PER SERVING UTILITY COMPANY.

GROUND, "GRD", "GND".

GF — BREAKER EQUIPPED WITH THE GROUND FAULT PROTECTION

GFI — "GROUND FAULT INTERRUPTER"

1a — CEILING LIGHT FIXTURE AND OUTLET. LOWER CASE LETTER INDICATES CONTROLLING SWITCH, NUMERAL INDICATES CIRCUIT. SHADED SYMBOL INDICATES FIXTURE WITH EMERGENCY POWER PROVISIONS.

1a — LIGHT FIXTURE OUTLET. LOWER CASE LETTER INDICATES CONTROLLING SWITCH, NUMERAL INDICATES CIRCUIT. SHADED CIRCLE DENOTES FIXTURE WITH EMERGENCY POWER PROVISIONS.

1a — STRIP FIXTURE. LOWER CASE LETTER INDICATES CONTROLLING SWITCH. NUMERAL INDICATES CIRCUIT. SHADED CIRCLE DENOTES FIXTURE WITH EMERGENCY POWER PROVISIONS.

1a — BRACKET OR WALL MOUNTED SURFACE OR RECESSED LIGHT FIXTURE AND OUTLET, HID, FLUORESCENT OR INCANDESCENT. LOWER CASE LETTER INDICATES CONTROLLING SWITCH, NUMERAL INDICATES CIRCUIT. SHADED CIRCLE DENOTES FIXTURE WITH EMERGENCY POWER PROVISIONS.

ILLUMINATED EXIT LIGHT FIXTURE. SIDE, BACK, CEILING, OR PENDANT MOUNTED, SINGLE OR DOUBLE FACED AS NOTED BY SHADED ARC, WITH OR WITHOUT DIRECTIONAL ARROW AS NOTED ON THE DRAWINGS. EXIT SIGN SHALL NOT BE USED AS JUNCTION BOX OR "THROUGH-WIRE"

L — LOW LEVEL EXIT LIGHT FIXTURE, WALL MOUNTED WITH OR WITHOUT DIRECTIONAL ARROW AS NOTED ON THE DRAWINGS. BOTTOM OF FIXTURE AT +10" ABOVE FINISHED FLOOR AND WITHIN FOUR INCHES OF DOOR FRAME WHERE APPLICABLE.

16 / 72 / +12'-0" — LIGHTING FIXTURE IDENTIFICATION SYMBOL. LETTER INDICATES FIXTURE TYPE. NUMERALS IN LOWER HALF OF HEXAGON INDICATE FIXTURE WATTAGE (INCLUDING BALLAST WHERE APPLICABLE). NUMERAL OUTSIDE TOP OF HEXAGON INDICATES NUMBER OF FIXTURES USED FOR LOAD CALCULATIONS. NUMERAL OUTSIDE BOTTOM OF HEXAGON INDICATES MOUNTING HEIGHT FROM FLOOR TO BOTTOM OF FIXTURE. OMISSION OF MOUNTING HEIGHT INDICATES CEILING MOUNTING.

WALL MOUNTED DUAL HEAD EMERGENCY LIGHTING FIXTURE UNIT.

W — TELEPHONE OUTLET, 4S DEEP BACKBOX & SINGLE GANG RING. MOUNT PER DETAIL #1 ON E0.1 U.N.O. "W" ADJACENT INDICATES WALL MOUNTED AT SWITCH HEIGHT PER DETAIL #1 ON E0.1 U.N.O. PROVIDE 1"CONDUIT MINIMUM STUBBED UP INTO CEILING SPACE.

DATA OUTLET, 4S DEEP BACKBOX & SINGLE GANG RING. MOUNT PER DETAIL #1 ON E0.1 U.N.O. PROVIDE 1"CONDUIT MINIMUM STUBBED UP INTO CEILING SPACE.

HATCH INDICATES PRIMARY SIDELIT DAYLIT ZONE.

HATCH INDICATES SECONDARY SIDELIT DAYLIT ZONE.

RECESSED MOUNTED COMBINATION POWER/DATA FLOOR BOX. PROVIDE WITH (2) DUPLEX GROUNDING TYPE RECEPTACLES, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE. FLOOR BOX SHALL BE EQUAL TO LEGRAD #RFB4 SERIES. COORDINATE COVER TYPE WITH THE ARCHITECT PRIOR TO ORDERING.

CLOSED CIRCUIT TELEVISION SYSTEM CAMERA OUTLET BOX , 3/4" CONDUIT FROM MDF/IDF AND 15 FEET OF SLACK OF CAT 6 CABLE LOCATED IN ACCESSIBLE CEILING SPACE FOR CLOSED CIRCUIT TELEVISION CAMERA. CABLE SHALL BE COILED-UP AND BUNDLE AT THE LOCATION INDICATED FOR FUTURE CONNECTION TO CAMERA EQUIPMENT BY THE DISTRICT. CAMERAS ON WALL SHALL BE MOUNTED AT 10'-6".

K — DIGITAL KEY PAD ARM/DISARM FOR SECURITY SYSTEM. MOUNT PER DETAIL #1 ON E0-0.1 U.N.O.

CR — ACCESS CONTROL CARD READER STATION MOUNTED AT +46". PROVIDE A 4S DEEP BOX WITH MINIMUM 1"C.O. STUBBED UP INTO NEAREST ACCESSIBLE CEILING SPACE. 2

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER RISING TALLEY — No. E 18592 — ELECTRICAL — STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 06-24-2024

SHEET TITLE:

ELECTRICAL SYMBOLS LIST AND ABBREVIATIONS

SCALE: NTS 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGR ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7523

E002

R: \Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E002.dwg 7-21-25-12:29 PM

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	FINISH	LAMP(S)	REMARKS	MANUFACTURER & NO.
A 9.5	PENDANT MOUNTED DIRECT LINEAR LIGHT FIXTURE WITH EXTRUDED ALUMINUM TRIM AND ACRYLIC DIFFUSER. MIN. 1000L OUTPUT PER FOOT.	WHITE SATIN	LED 4000K	TYPE 'A': REFER TO LIGHTING PLANS FOR FIXTURE LENGTHS. PROVIDE INSTALLATION SHOP DRAWINGS PRIOR TO ORDERING. PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	LUMENWERX #VIA2P-D-WDO-FH-NA-SW-90CRI-1000LMF-NA-40K-XX-UNV-D1-1C-ACS-W
B 9.5	PENDANT MOUNTED DIRECT LINEAR LIGHT FIXTURE WITH EXTRUDED ALUMINUM TRIM AND ACRYLIC DIFFUSER. MIN. 1000L OUTPUT PER FOOT.	WHITE SATIN	LED 4000K	TYPE 'B': REFER TO LIGHTING PLANS FOR FIXTURE LENGTHS. PROVIDE INSTALLATION SHOP DRAWINGS PRIOR TO ORDERING. PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	LUMENWERX #VIA2P-D-BNO-FH-NA-SW-90CRI-1000LMF-NA-40K-XX-UNV-D1-1C-ACS-W
C 47	2'x2' LED RECESSED TROFFER WITH 4 SIDED LINEAR ANIDOLIC OPTICS AND FULLY ENCLOSED LIGHT SOURCE COMPARTMENT.	BAKED WHITE ENAMEL	LED 4000K 4100 LUMEN MINIMUM	TYPE "C1/29": SIMILAR TO TYPE "A" EXCEPT 3500 LUMENS MINIMUM PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	COLUMBIA LIGHTING #LCAT22-9-40-HL-G-E-U EQUAL BY NULITE #BRM2 OR
D 15	4" SQUARE LED DOWNLIGHT WITH SEMI-SPECULAR LOWER REFLECTOR AND CLEAR TRIM. 2146 LUMEN MIN. OUTPUT. 50° BEAM ANGLE.	CLEAR TRIM	LED 4000K 2146 LUMEN MINIMUM	PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	LUMENWERX #IAESR-TRM-SW-IC-ASB-UNV-20-D1-AE4SRB-SW-20-50DEG-2STP-90CRI-40K-TRM-FSSPC
E 40	SURFACE/WALL MOUNTED LIGHT FIXTURE WITH "CRESCENT" SHAPED DIFFUSER. MIN. 2000L OUTPUT.	WHITE	LED 4000K		LITHONIA LIGHTING #WL4-20L-MVOLT-EZ1-L840 EQUAL BY METALUX "SWLED" SERIES OR DAY-BRITE "FLUXSTREAM STRIP" SERIES
F 5	EMERGENCY EDGE LIT EXIT LIGHT, LED TYPE, RED LETTERS, SINGEL FACE, WALL, CEILING OR END MOUNT, WITH DIRECTIONAL ARROWS AS SHOWN. 277V.	CLEAR WITH ALUMINUM HOUSING	LED	TYPE "F": VERIFY MOUNTING CONFIGURATION AND ARROWS PRIOR TO ORDERING FIXTURES.	BEGHELLI #CYC-SA-LR1-C-*-BA EQUAL BY CHLORIDE "44R" SERIES OR
G 22	SURFACE MOUNTED LED 24" VANITY FIXTURE WITH DIE-FORMED STEEL HOUSING AND GLASS DIFFUSER.	COLOR SELECTED BY ARCHITECT	LED 3500K	TYPE "G": FIXTURES SHALL BE MOUNTED DIRECTLY ABOVE MIRROR AND CENTER WITH MIRROR. REFER TO THE LIGHTING PLANS FOR QTY. AND LOCATIONS.	RBW LIGHTING #PAS-3V-DDD-XX-35-1-10V-UNV-IP65
H 8.2	SURFACE MOUNTED UNDER CABINET LIGHT FIXTURE WITH CONTROL SWITCH. MIN. 544L OUTPUT.	WHITE	LED 4000K		JUNO LIGHTING #UCES-18IN-SW-W4-90CRI-WH-M6 EQUAL BY ACCENT "9018" SERIES OR GLOBALUX LIGHTING "AUC" SERIES
I 9.5	RECESSED MOUNTED DIRECT LINEAR LIGHT FIXTURE WITH EXTRUDED ALUMINUM TRIM AND ACRYLIC DIFFUSER. MIN. 935L OUTPUT PER FOOT.	WHITE SATIN	LED 4000K	TYPE 'I': REFER TO LIGHTING PLANS FOR FIXTURE LENGTHS. PROVIDE INSTALLATION SHOP DRAWINGS PRIOR TO ORDERING. PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	JLC-TECH #TBAR LED-MN-4-XX-B-U-W
J 15	PENDANT MOUNTED FIXTURE WITH WOOL FABRIC ACOUSTIC DISC AND 5.9" GLOBE DIFFUSER. 2	COLOR SELECTED BY ARCHITECT	LED 4000K		LUMINART LIGHTING #L82PEBESOO60M01-XX-4000-120V
K 23	PENDENT MOUNTED 39" ROUND DIRECT/INDIRECT LED FIXTURE WITH FABRIC LAMPSHADE.	COLOR SELECTED BY ARCHITECT	LED 4000K		LUMINART LIGHTING #CISESP100003-XX-4000-120V 0-10V DIMMING
L 51	PENDENT MOUNTED CUBES WITH A STEEL FRAME AND SATIN OPAL GLOBES. 3000 LUMENS	COLOR SELECTED BY ARCHITECT	LED 3500K		RBW LIGHTING #RGW-5-XX3500-1-10V-UNV
M 50	SURFACE MOUNTED VAPOR TIGHT LED FIXTURE WITH POLYCARBONATE HOUSING AND SILICONE GASKET LENS. MINIMUM 6000 LUMEN OUTPUT.	WHITE	LED 4000K		BEGHELLI #BS101LED-4HT-LO-WT50-120-277V EQUAL BY METALUX #4VT3 OR VISIONEERING
N 24	PENDANT MOUNTED LED FIXTURE WITH 12" BLOWN GLASS GLOBE DIFFUSER AND ELECTRICAL BELT CONNECTION. 2	COLOR SELECTED BY ARCHITECT	LED 3500K 2		VIBIA LIGHTING #PLUSMINUS-6235-3500K-SURFACE 2
O 15	4" SQUARE LED WALL WASH DOWNLIGHT WITH SEMI-SPECULAR LOWER REFLECTOR AND CLEAR TRIM. 1200 LUMEN MIN. OUTPUT.	CLEAR TRIM	LED 4000K 1200 LUMEN MINIMUM	PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	LUMENWERX #AESRWW-TRM-SW-IC-ASB-UNV-20-D1-AE4SRWWB-SW-20-WW-2STP-90CRI-40K-TRM-FSSPC
P 12	PENDANT MOUNTED DIRECT LINEAR LIGHT FIXTURE WITH EXTRUDED ALUMINUM TRIM AND ACRYLIC DIFFUSER.	WHITE	LED 4000K	TYPE 'P': REFER TO LIGHTING PLANS FOR FIXTURE LENGTHS. PROVIDE INSTALLATION SHOP DRAWINGS PRIOR TO ORDERING. PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	LUMENPULSE #LL2P-D-120-SU4-DHO40K-WFL-DIM-ACC50-WH
Q 8	SURFACE MOUNTED DIRECT LINEAR LIGHT FIXTURE WITH EXTRUDED ALUMINUM TRIM AND ACRYLIC DIFFUSER.	WHITE	LED 4000K	PROVIDE EMERGENCY BATTERY PACK WHERE NOTED ON DRAWINGS.	ARON LIGHTING #EZT1-GYP-4FA-1000-B2-40K9-UNV-DM-W
R 8	SURFACE MOUNTED DIRECT/INDIRECT LINEAR LIGHT FIXTURE WITH EXTRUDED ALUMINUM TRIM, END CAPS AND IP 65 RATED.	SILVER	LED 4000K	TYPE 'Q': REFER TO LIGHTING PLANS FOR FIXTURE LENGTHS. PROVIDE INSTALLATION SHOP DRAWINGS PRIOR TO ORDERING.	KLUS LIGHTING #PLAKIN-DUO EXTRUSION-A18069N-B17208C

ACCEPTANCE TESTING

MANDATORY ACCEPTANCE TESTING PER TITLE 24, PART 6 SECTION 130.4 SHALL BE AS FOLLOWS:

THE CONTRACTOR SHALL PROVIDE THE ACCEPTANCE TESTING AGENT. THE ACCEPTANCE TESTING AGENT SHALL BE A CERTIFIED LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN (CLCATT). THE CLCATT SHALL PERFORM ALL LIGHTING CONTROL INSTALLATION CERTIFICATION AS REQUIRED BY TITLE 24, PART 6 SECTION 130.4 (a) AND 130.4 (b). THIS SHALL INCLUDE, BUT NOT LIMITED TO, FILLING OUT, SIGNING AND SUBMITTING ALL REQUIRED DOCUMENTATION.

THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE LIGHTING CONTROL SYSTEMS WITH THE CLCATT PRIOR TO INSTALLATION.

LIGHTING CONTROL SYSTEM SEQUENCE OF OPERATIONS

REFER TO LIGHTING PLANS FOR QUANTITY AND LOCATION OF ALL LIGHTING CONTROL COMPONENTS AND LIGHT FIXTURES; IDENTIFICATION OF LIGHT FIXTURE AND DEVICE SWITCH LEG IDENTIFICATION. REFER TO THE LIGHTING CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION. LIGHTING CONTROLS SHALL BE INSTALLED IN COMPLIANCE WITH 2022 CALIFORNIA ENERGY CODE (CEC) SECTION 130.1 MINIMUM.

OFFICE(LIGHTING) - ROOM OCCUPANCY SENSOR(S) SHALL TURN LIGHT FIXTURES OFF WHEN ROOM HAS BEEN UNOCCUPIED FOR 20 MINUTES. LIGHT FIXTURES SHALL BE TURNED ON TO 50 PERCENT WHEN ROOM BECOMES OCCUPIED. WHEN LIGHT FIXTURES ARE TURNED ON AT WALL SWITCH, THEY SHALL BE SET OR COME ON TO FULL BRIGHTNESS OR PRESET FOOT CANDLE LEVELS.

WALL DIMMERS SHALL BE USED FOR MANUAL CONTROL OF LIGHT FIXTURES AND SHALL BE EQUIPPED WITH AN ON/OFF SWITCH.

LIGHT FIXTURES WHICH ARE REQUIRED TO HAVE AUTOMATIC "DAYLIGHTING" CONTROLS SHALL ALSO BE CONTROLLED WITH A PHOTOCELL IN ADDITION TO OCCUPANCY SENSORS AND WALL DIMMERS. THE PHOTOCELL SHALL MEASURE THE AMOUNT OF DAYLIGHT ENTERING THE SPACE AND REDUCE THE LIGHT OUTPUT OF THE LIGHT FIXTURES TO MAINTAIN THE DESIGNED FOOT CANDLE LEVELS IN THE ROOM. WALL DIMMERS SHALL ALLOW THE LIGHT FIXTURES TO DIM LOWER THAN THE LIGHT BEING MEASURED IN THE ROOM, BUT NOT HIGHER.

WALL DIMMERS SHALL BE USED FOR MANUAL CONTROL OF LIGHT FIXTURES AND SHALL BE EQUIPPED WITH AN ON/OFF SWITCH. WHERE MULTI-BUTTON SWITCH(S)/DIMMER(S) ARE USED, EACH BUTTON SHALL BE PROGRAMMED FOR A SPECIFIC LIGHTING SCENE. ACTIVATION OF A SPECIFIC BUTTON SHALL AUTOMATICALLY RECALL THE LIGHTING SCENE. "ON/OFF" AND MANUAL DIMMING CONTROL FUNCTIONS SHALL OVERRIDE PRESET SCENES. REFER TO LIGHTING CONTROL WIRING DIAGRAMS FOR SCENE SETTINGS AND SWITCH BUTTON IDENTIFICATION WHERE REQUIRED.

LIGHT FIXTURES WHICH ARE REQUIRED TO HAVE AUTOMATIC "DAYLIGHTING" CONTROLS SHALL ALSO BE CONTROLLED WITH A PHOTOCELL IN ADDITION TO OCCUPANCY SENSORS AND WALL DIMMERS. THE PHOTOCELL SHALL MEASURE THE AMOUNT OF DAYLIGHT ENTERING THE SPACE AND REDUCE THE LIGHT OUTPUT OF THE LIGHT FIXTURES TO MAINTAIN THE DESIGNED FOOT CANDLE LEVELS IN THE ROOM. WALL DIMMERS SHALL ALLOW THE LIGHT FIXTURES TO DIM LOWER THAN THE LIGHT BEING MEASURED IN THE ROOM, BUT NOT HIGHER.

WALL SWITCHES SHALL BE USED FOR MANUAL "ON/OFF" CONTROL OF LIGHT FIXTURES.

WHERE SHOWN ON PLANS, WALL DIMMERS SHALL BE USED FOR MANUAL CONTROL OF LIGHT FIXTURES AND SHALL BE EQUIPPED WITH AN "ON/OFF" SWITCH.

STORAGE ROOMS - ROOM OCCUPANCY WALL SENSOR(S) SHALL TURN LIGHT FIXTURES OFF WHEN ROOM HAS BEEN UNOCCUPIED FOR 15 MINUTES. LIGHT FIXTURES SHALL BE MANUALLY TURNED ON WHEN ROOM IS OCCUPIED. WHEN LIGHT FIXTURES ARE TURNED ON, THEY SHALL BE SET TO FULL BRIGHTNESS OR PRESET FOOT CANDLE LEVELS.

LIGHT LEVELS:
LIGHTING LEVELS (FOOTCANDLES) WILL BE DESIGNED IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY (IES) GUIDELINES. THE FOLLOWING LIGHTING LEVELS WILL BE PROVIDED:

AREA	MAINTAINED LIGHTING LEVEL AT THE WORK PLANE
OFFICES	40-50
LOBBY	20-30
STORAGE/JANITOR'S ROOM	10-20
COMMUNICATIONS EQUIPMENT ROOMS	50-70
LIBRARY	40-50

DEMAND RESPONSE - LIGHT FIXTURES, RECEPTACLES AND LIGHTING CONTROLS SUBJECTED TO DEMAND RESPONSE REQUIREMENTS SHALL BE INSTALLED IN ACCORDANCE WITH CEC SECTION 110.12. LIGHTING CONTROLS SHALL COMPLY WITH THE REQUIREMENTS OF CEC 110.12(a). LIGHT FIXTURES SUBJECTED TO DEMAND RESPONSE SHALL HAVE THEIR LIGHTING POWER REDUCED BY A MINIMUM OF 15 PERCENT. CONTROLLED RECEPTACLES SHALL BE AUTOMATICALLY TURNED OFF.

OUTDOOR LIGHTING – TIMECLOCK PROGRAMMING SHALL BE PROVIDE BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL RECEIVE OUTDOOR LIGHTING SCHEDULE FROM THE OWNER AND PROGRAM SYSTEM ACCORDINGLY.

THE AUTOMATIC SCHEDULING CONTROL IS CAPABLE OF REDUCING OUTDOOR LIGHTING POWER BY 50-90% DURING PRE-PROGRAMMED UNOCCUPIED PERIODS.

THE AUTOMATIC SCHEDULING CONTROL SHALL ALLOW A MINIMUM OF 2 NIGHT TIME PERIODS WITH INDEPENDENTLY PROGRAMMED LIGHTING LEVELS.

THE AUTOMATIC SCHEDULING CONTROLS MAY INCLUDE AN OVERRIDE FUNCTION FOR A MAXIMUM OF 2 HOURS WHEN IT IS IN A SCHEDULED DIM OR OFF STATE.

LIGHT FIXTURES WITH MOTION SENSOR CONTROL SHALL HAVE THEIR POWER REDUCED BY 50 PERCENT 15 MINUTES AFTER THE AREA HAS BEEN VACATED. FIXTURES SHALL BE RETURNED TO FULL BRIGHT WHEN THE AREA BECOMES OCCUPIED.

1

LIGHTING FIXTURE NOTES

1. EXIT SIGNS WITH THROUGH WIRING SHALL BE EQUIPPED WITH A SEPARATE JUNCTION BOX FOR TERMINATION OF CONDUITS. FURNISH A SEPARATE BOX FOR EACH CIRCUIT.
2. CONTRACTOR SHALL VERIFY ALL MOUNTING REQUIREMENTS FOR ALL RECESSED LIGHTING FIXTURES, PRIOR TO SHOP DRAWINGS SUBMITTALS. IT IS THE CONTRACTORS RESPONSIBILITY TO SECURE THE MOUNTING HARDWARE THAT IS COMPATIBLE WITH THE CEILING AND THE CONFIGURATION OF THE LIGHTING LAYOUT.
3. FOR LIGHTING FIXTURE VOLTAGE RATINGS, THE CONTRACTOR IS RESPONSIBLE TO VERIFY FIXTURE AND DRIVER VOLTAGES WITH BRANCH CIRCUIT WIRING.
4. LAMP COLOR FOR LED FIXTURES SHALL BE 4000°K U.N.O.
5. LENSES OF ALL LED LIGHTING FIXTURES SHALL NOT BE LESS THAN 0.125" THICK, EQUAL TO KSH-K12 WHERE APPLICABLE.
6. FOR FIXTURES RECESSED INTO NON-COMBUSTIBLE CEILINGS, PROVIDE YOKE MOUNTED OUTLET BOXES, ACCESSIBLE FROM INSIDE FIXTURE.
7. FIXTURES SHALL BE U.L. LISTED FOR INTENDED LOCATION.
8. FINISH OF FIXTURES SHALL BE AS SELECTED BY ARCHITECT.
9. LIGHTING FIXTURES IN MECHANICAL SPACES ARE SHOWN IN THEIR APPROXIMATE LOCATION ONLY. DO NOT INSTALL LIGHT OUTLETS FOR FIXTURES UNTIL MECHANICAL PIPING AND DUCTWORK ARE INSTALLED; THEN LIGHTING FIXTURES SHALL BE INSTALLED IN LOCATIONS BEST SUITED FOR EQUIPMENT ARRANGEMENT AND AS APPROVED BY THE PROJECT MANAGER.
10. THE CONTRACTOR SHALL VERIFY ALL WINDOW HEIGHTS AND DAYLIT ZONES PRIOR TO INSTALLATION OF LIGHTING CONTROLS.
11. ALL LED LIGHT FIXTURES SHALL BE TESTED TO LM-79 AND LM-80 IES STANDARDS.

SUSPENDED ACOUSTICAL CEILINGS:

HEAVY DUTY GRID SYSTEM:
FLUSH OR RECESSED LIGHT FIXTURES WEIGHING LESS THAN 56 POUNDS MAY BE SUPPORTED DIRECTLY ON THE RUNNERS OF A HEAVY DUTY GRID SYSTEM. IN ADDITION, THEY SHALL HAVE A MINIMUM OF TWO 12 GAUGE SLACK SAFETY WIRES ATTACHED TO THE FIXTURE AT DIAGONAL CORNERS AND ANCHORED TO THE STRUCTURE ABOVE. ALL 4 FOOT BY 4 FOOT LIGHT FIXTURES SHALL HAVE SLACK SAFETY WIRES AT EACH CORNER. ALL FLUSH OR RECESSED LIGHT FIXTURES WEIGHING 56 POUNDS OR MORE SHALL BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN 4 TAUT 12 GAUGE WIRES EACH ATTACHED TO THE FIXTURE AND TO THE STRUCTURE ABOVE. REGARDLESS OF THE TYPE OF CEILING GRID SYSTEM USED. THE 4 TAUT 12 GAUGE WIRES INCLUDING THEIR ATTACHMENT TO THE STRUCTURE ABOVE SHALL BE CAPABLE OF SUPPORTING 4 TIMES THE WEIGHT OF THE UNIT.

SURFACE MOUNTED FIXTURES:
SUPPORT SURFACE MOUNTED LIGHT FIXTURES BY AT LEAST TWO POSITIVE DEVICES WHICH SURROUND THE CEILING RUNNER AND WHICH ARE EACH SUPPORTED FROM THE STRUCTURE ABOVE BY A 12 GAUGE WIRE. SPRING CLIPS OR CLAMPS THAT CONNECT ONLY TO THE RUNNER ARE NOT ACCEPTABLE. PROVIDE ADDITIONAL SUPPORTS WHEN LIGHT FIXTURES ARE EIGHT FEET OR LONGER.

SUSPENDED DRYWALL CEILINGS:
ALL RECESSED OR DROP-IN LIGHT FIXTURES SHALL BE SUPPORTED DIRECTLY BY MAIN RUNNERS OR BY SUPPLEMENTAL FRAMING WHICH IS SUPPORTED BY MAIN RUNNERS. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE CEILING CONTRACTOR TO PROVIDE APPROPRIATE FRAMING AND LOCATION FOR FIXTURES. SURFACE MOUNTED FIXTURES SHALL BE ATTACHED TO A MAIN RUNNER WITH A POSITIVE CLAMPING DEVICE MADE OF MATERIAL WITH A MINIMUM OF 14 GAUGE. ROTATIONAL SPRING CATCHES SHALL NOT BE ALLOWED.

PENDANT MOUNTED FIXTURES:
PENDANT MOUNTED FIXTURES SHALL BE SUPPORTED BY A WIRE OR (SAFETY) CABLE PASSING THROUGH EACH PENDANT HANGER AND CAPABLE OF SUPPORTING 4 TIMES THE WEIGHT OF THE FIXTURE. WHERE PENDANT MOUNTED FIXTURES ARE INSTALLED ON A GRID CEILING OR WHERE THE FIXTURE WEIGHS 50 POUNDS OR MORE, THE WIRE OR CABLE PASSING THROUGH THE PENDANT HANGER SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE.

PENDANT MOUNTED FIXTURES SHALL BE SUPPLIED WITH SWIVEL HANGERS AND SHALL BE CAPABLE OF SWINGING 45 DEGREES IN ANY DIRECTION FROM PLUMB WITHOUT OBSTRUCTION. FIXTURES SHALL HAVE STEMS WHICH ARE ONE PIECE WITHOUT COUPLING AND ARE TO HAVE THE SAME FINISH AS THE FIXTURE AND SWIVEL HANGER CANOPY. INDUSTRIAL TYPE FLUORESCENT FIXTURES INSTALLED IN AREAS OR ROOMS WITH EXPOSED STRUCTURE (NO CEILING) MAY BE CHAIN HUNG IN LIEU OF PROVIDING A STEM AND CANOPY. WHERE FIXTURES CAN NOT SWING UNOBSTRUCTED 45 DEGREES IN ANY DIRECTION, ADDITIONAL GUY WIRES OR SOLID BRACING IS REQUIRED. THE CONTRACTOR SHALL SUBMIT THE METHOD OF BRACING TO THE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — ORIN HSING FANG — No. E 16592 — ELECTRICAL — STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

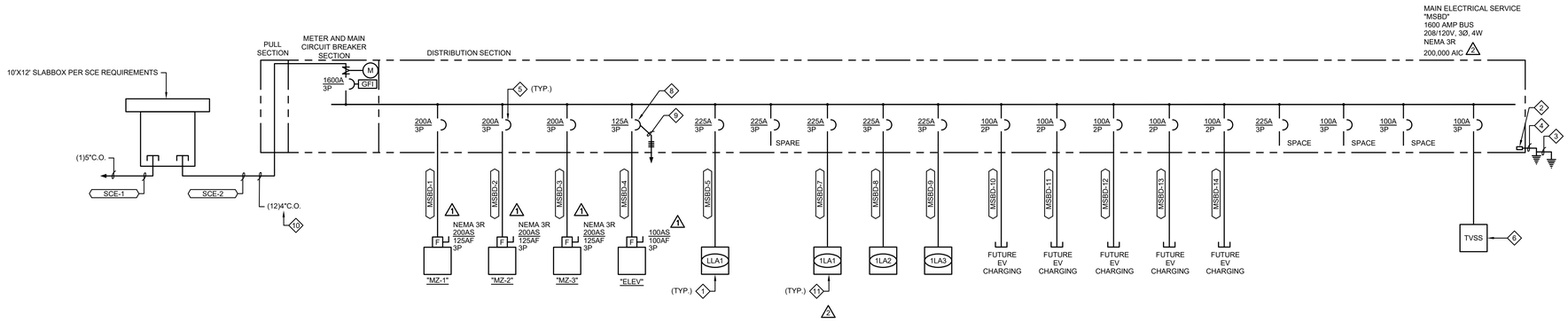
LIGHTING FIXTURE SCHEDULE AND NOTES

SCALE: NTS 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E003

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4753 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0317
Fax 909.980.7023



SHEET NOTES

1. PANELBOARDS FOR ENTIRE PROJECT SHALL BE PROVIDED WITH SPACE PROVISIONS FOR BRANCH CIRCUIT ENERGY MONITORING PER CALIFORNIA ENERGY GUIDELINES, TYPICAL U.N.O.
2. CONTINUOUS COPPER GROUND BUS AND BONDING JUMPER AT MAIN SERVICE. THIS SHALL BE THE CENTRAL GROUND POINT FOR THE PROJECT. NO OTHER GROUND POINTS MAY BE USED.
3. INSTALL 1" CONDUIT & 1#4/0 TO ACCESSIBLE COLD WATER LINE WITHIN 5' OF LINES ENTERING BUILDING. BOND TO BUILDING STEEL USING EXOTHERMIC WELD PROCESS AND APPROVED GROUNDING CLAMPS TO BUILDING WATER LINE.
4. INSTALL 1"C. WITH 1#250 MCM GROUNDING ELECTRODE CONDUCTOR TO "UFER" GROUND SYSTEM CABLE. UFER GROUND SYSTEM SHALL BE A MINIMUM OF 40' OF 250 MCM BARE COPPER GROUND IN BUILDING FOOTINGS.
5. ALL CIRCUIT BREAKERS SHALL BE FULLY RATED; NO SERIES RATED CIRCUIT BREAKER SHALL BE USED, TYPICAL.
6. PROVIDE AND INSTALL TRANSIENT VOLTAGE SURGE SUPPRESSION FILTER EQUAL TO CURRENT TECHNOLOGY #TG3-200-480-3Y-SN-T/B-MI-F23.
7. FURNISH GROUND BUS IN EACH BRANCH CIRCUIT PANEL. ALL PANELS 208/120 VOLT, SHALL HAVE THE FEEDER EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO GROUND BUS. FURNISH EQUIPMENT GROUNDING CONDUCTORS IN EVERY FEEDER AND BRANCH CIRCUIT, RUN TO LAST OUTLET AND CONNECT TO BUS. CONDUIT GROUND IS NOT ACCEPTABLE AS A SUBSTITUTE. TYPICAL ALL PANELS, SWITCHBOARDS, DISTRIBUTION PANELBOARDS, AND SWITCHGEAR.
8. PROVIDE SHUNT-TRIP CIRCUIT BREAKER AT ELEVATOR AND CONNECT TO BUILDING FIRE ALARM SYSTEM TO DISCONNECT POWER PRIOR TO THE FLOW OF FIRE SPRINKLER WATER PER NFPA 72-21.4 & ASME 17.1.
9. EXTEND 3/4" CONDUIT AND WIRING TO FIRE ALARM CONTROL PANEL.
10. COORDINATE WITH SCE FOR SERVICE PATHWAY TO SWITCHGEAR AND PROVIDE CONDUITS AS NEED OR CABLE TRENCH PER SCE REQUIREMENTS.
11. ALL DISTRIBUTION EQUIPMENT SHALL BE FULLY RATED; NO SERIES RATED EQUIPMENT SHALL BE USED, TYPICAL.

DIST. BOARD: MSBD LOAD SUMMARY & FEEDER SCHEDULE VOLTAGE: 208/120V,3P,4W

BRANCH: NORMAL MIN. BUS: 1,600 AMPS

ENCLOSURE: NEMA-3R ** MCB TRIP: 1,600 AMPS

AIC RATING: 200,000 AIC SYM, MINIMUM

FEEDER NUMBER	FEEDER FROM	FEEDER TO	POLES	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS (AWG)	GROUND (AWG)	DEMAND LOAD AMPS	DEMAND LOAD KVA	CONNECTED LOAD AMPS	CONNECTED LOAD KVA	FEEDER LENGTH*	VOLTAGE DROP	REMARKS
MSBD-1	MSBD	"MZ-1"	3	1	2 1/2"	3 # 4/0	4	120.19	43.30	120.19	43.30	170	1.08%	
MSBD-2	MSBD	"MZ-2"	3	1	2 1/2"	3 # 4/0	4	120.19	43.30	120.19	43.30	200	1.27%	
MSBD-3	MSBD	"MZ-3"	3	1	2 1/2"	3 # 4/0	4	120.19	43.30	120.19	43.30	185	1.18%	
MSBD-4	MSBD	ELEV.	3	1	2"	3 # 1/0	6	97.15	35.00	97.15	35.00	150	1.47%	
MSBD-5	MSBD	LLA1	3	1	2 1/2"	4 # 4/0	4	57.28	20.64	58.78	21.18	135	0.42%	⚠1
MSBD-6	MSBD													SPARE
MSBD-7	MSBD	1LA1	3	1	2 1/2"	4 # 4/0	4	112.44	40.51	105.93	38.16	70	0.42%	
MSBD-8	MSBD	1LA2	3	1	2 1/2"	4 # 4/0	4	38.58	13.90	49.41	17.80	70	0.18%	
MSBD-9	MSBD	1LA3	3	1	2 1/2"	4 # 4/0	4	119.80	43.16	120.58	43.44	175	1.12%	
MSBD-10	MSBD	EV	2	1						80.00	16.64			FUTURE
MSBD-11	MSBD	EV	2	1						80.00	16.64			FUTURE
MSBD-12	MSBD	EV	2	1						80.00	16.64			FUTURE
MSBD-13	MSBD	EV	2	1						80.00	16.64			FUTURE
MSBD-14	MSBD	EV	2	1						80.00	16.64			FUTURE
MSBD-15	MSBD		3											
										1023.35	368.68			SUBTOTAL
														25% OF LARGEST MOTOR
										1023.35	368.68			TOTAL LOAD

* FEEDER LENGTH IN FEET IS INDICATED FOR VOLTAGE DROP CALCULATION ONLY AND SHALL NOT BE USED FOR QUANTITY TAKEOFFS.

** MCB = MAIN CIRCUIT BREAKER ** MLO = MAIN LUGS ONLY

⚠1

Short-Circuit Calculations

The following calculations are based on the "Point to Point" method where:

Isc = Isc x M M= 1/(1+f) f = 1.732 x L x I / C x E XFMR: f = IP(sca)x1.73xVp x%Z / 100,000xKVA IS(sca)= Vp x M x IS(sca) / Vs

(All calculations utilize copper conductors)

Fault Point	Panel / Transformer	Source (Fault Point)	Source I (amps)	Conduit Type	Wire/Bus Size	'C' value	E (volts)	L (length)	XFMR KVA	XFMR Z	f	M	Isc
1	UTILITY		200000										200000
2	Feeder ("MZ-1")	1	200000	M	1 Set(s) of 4/0	12500	208	170			22.649	0.04	8457
3	Feeder ("MZ-2")	1	200000	M	1 Set(s) of 4/0	12500	208	200			26.646	0.04	7234
4	Feeder ("MZ-3")	1	200000	M	1 Set(s) of 4/0	12500	208	185			24.648	0.04	7798
5	Feeder (ELEVATOR)	1	200000	M	1 Set(s) of 1/0	7692	208	150			32.476	0.03	5974
6	Feeder (Panel "LLA1")	1	200000	M	1 Set(s) of 4/0	12500	208	135			17.986	0.05	10534
7	Feeder (Panel "1LA1")	1	200000	M	1 Set(s) of 4/0	12500	208	70			9.326	0.10	19368
8	Feeder (Panel "1LA2")	1	200000	M	1 Set(s) of 4/0	12500	208	70			9.326	0.10	19368
9	Feeder (Panel "1LA3")	1	200000	M	1 Set(s) of 4/0	12500	208	175			23.315	0.04	8225

⚠5 ⚠5

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHIEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 06-24-2024

SHEET TITLE:

SINGLE LINE DIAGRAM AND FEEDER SCHEDULE

SCALE: NTS

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E004

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E004.dwg 7-21-25-12:29 PM

Size-Ampacity	Copper AWG 12 (Max ampacity - 25 amps 60°)																Copper AWG 10 (Max ampacity - 30 amps 60°)															
Strands	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1
Phase	1	1	1	1	3	3	1	1	3	3	1	1	1	1	3	3	1	1	1	1	3	3	1	1	3	3	1	1	1	1	3	3
Voltage	120	120	208	208	208	208	240	240	240	240	277	277	480	480	480	480	120	120	208	208	208	208	240	240	240	240	277	277	480	480	480	480
Amps	Maximum lenghts of wire at 3% voltage drop in feet																Maximum lenghts of wire at 3% voltage drop in feet															
1	909.1	932.6	1575.8	1616.6	1819.5	1866.7	1818.2	1865.3	2099.5	2153.8	2098.5	2152.8	3636.4	3730.6	4198.9	4307.7	1451.6	1487.6	2516.1	2578.5	2905.4	2977.4	2903.2	2975.2	3352.4	3435.5	3350.8	3433.9	5806.5	5950.4	6704.7	6870.9
2	454.5	466.3	787.9	808.3	909.8	933.3	909.1	932.6	1049.7	1076.9	1049.2	1076.4	1818.2	1865.3	2099.5	2153.8	725.8	743.8	1258.1	1289.3	1452.7	1488.7	1451.6	1487.6	1676.2	1717.7	1675.4	1716.9	2903.2	2975.2	3352.4	3435.5
3	303.0	310.9	525.3	538.9	606.5	622.2	606.1	621.8	699.8	717.9	699.5	717.6	1212.1	1243.5	1399.6	1435.9	483.9	495.9	838.7	859.5	968.5	992.5	967.7	991.7	1117.5	1145.2	1116.9	1144.6	1935.5	1983.5	2234.9	2290.3
4	227.3	233.2	393.9	404.1	454.9	466.7	454.5	466.3	524.9	538.5	524.6	538.2	909.1	932.6	1049.7	1076.9	362.9	371.9	629.0	644.6	726.3	744.4	725.8	743.8	838.1	858.9	837.7	858.5	1451.6	1487.6	1676.2	1717.7
5	181.8	186.5	315.2	323.3	363.9	373.3	363.6	373.1	419.9	430.8	419.7	430.6	727.3	746.1	839.8	861.5	290.3	297.5	503.2	515.7	581.1	595.5	580.6	595.0	670.5	687.1	670.2	686.8	1161.3	1190.1	1340.9	1374.2
6	151.5	155.4	262.6	269.4	303.3	311.1	303.0	310.9	349.9	359.0	349.7	358.8	606.1	621.8	699.8	717.9	241.9	247.9	419.4	429.8	484.2	496.2	483.9	495.9	558.7	572.6	558.5	572.3	967.7	991.7	1117.5	1145.2
7	129.9	133.2	225.1	230.9	259.9	266.7	259.7	266.5	299.9	307.7	299.8	307.5	519.5	532.9	599.8	615.4	207.4	212.5	359.4	368.4	415.1	425.3	414.7	425.0	478.9	490.8	478.7	490.6	829.5	850.1	957.8	981.6
8	113.6	116.6	197.0	202.1	227.4	233.3	227.3	233.2	262.4	269.2	262.3	269.1	454.5	466.3	524.9	538.5	181.5	186.0	314.5	322.3	363.2	372.2	362.9	371.9	419.0	429.4	418.9	429.2	725.8	743.8	838.1	858.9
9	101.0	103.6	175.1	179.6	202.2	207.4	202.0	207.3	233.3	239.3	233.2	239.2	404.0	414.5	466.5	478.6	161.3	165.3	279.6	286.5	322.8	330.8	322.6	330.6	372.5	381.7	372.3	381.5	645.2	661.2	745.0	763.4
10	90.9	93.3	157.6	161.7	182.0	186.7	181.8	186.5	209.9	215.4	209.8	215.3	363.6	373.1	419.9	430.8	145.2	148.8	251.6	257.9	290.5	297.7	290.3	297.5	335.2	343.5	335.1	343.4	580.6	595.0	670.5	687.1
15	60.6	62.2	105.1	107.8	121.3	124.4	121.2	124.4	140.0	143.6	139.9	143.5	242.4	248.7	279.9	287.2	96.8	99.2	167.7	171.9	193.7	198.5	193.5	198.3	223.5	229.0	223.4	228.9	387.1	396.7	447.0	458.1
16	56.8	58.3	98.5	101.0	113.7	116.7	113.6	116.6	131.2	134.6	131.2	134.6	227.3	233.2	262.4	269.2	90.7	93.0	157.3	161.2	181.6	186.1	181.5	186.0	209.5	214.7	209.4	214.6	362.9	371.9	419.0	429.4
17	53.5	54.9	92.7	95.1	107.0	109.8	107.0	109.7	123.5	126.7	123.4	126.6	213.9	219.4	247.0	253.4	85.4	87.5	148.0	151.7	170.9	175.1	170.8	175.0	197.2	202.1	197.1	202.0	341.6	350.0	394.4	404.2
18	50.5	51.8	87.5	89.8	101.1	103.7	101.0	103.6	116.6	119.7	116.6	119.6	202.0	207.3	233.3	239.3	80.6	82.6	139.8	143.3	161.4	165.4	161.3	165.3	186.2	190.9	186.2	190.8	322.6	330.6	372.5	381.7
19	47.8	49.1	82.9	85.1	95.8	98.2	95.7	98.2	110.5	113.4	110.4	113.3	191.4	196.3	221.0	226.7	76.4	78.3	132.4	135.7	152.9	156.7	152.8	156.6	176.4	180.8	176.4	180.7	305.6	313.2	352.9	361.6
20	45.5	46.6	78.8	80.8	91.0	93.3	90.9	93.3	105.0	107.7	104.9	107.6	181.8	186.5	209.9	215.4	72.6	74.4	125.8	128.9	145.3	148.9	145.2	148.8	167.6	171.8	167.5	171.7	290.3	297.5	335.2	343.5
25	36.4	37.3	63.0	64.7	72.8	74.7	72.7	74.6	84.0	86.2	83.9	86.1	145.5	149.2	168.0	172.3	58.1	59.5	100.6	103.1	116.2	119.1	116.1	119.0	134.1	137.4	134.0	137.4	232.3	238.0	268.2	274.8
30																	48.4	49.6	83.9	86.0	96.8	99.2	96.8	99.2	111.7	114.5	111.7	114.5	193.5	198.3	223.5	229.0
35																																
40																																
45																																
50																																
60																																
70																																
80																																
90																																
100																																

Size-Ampacity	Copper AWG 8 (Max ampacity - 40 amps 60°)																Copper AWG 6 (Max ampacity - 55 amps 60°)										Copper AWG 4 (Max ampacity - 70 amps 60°)							
Strands	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Phase	1	1	1	1	3	3	1	1	3	3	1	1	1	1	3	3	1	1	3	1	3	1	3	1	3		1	1	3	1	3	1	1	3
Voltage	120	120	208	208	208	208	240	240	240	240	277	277	480	480	480	480	120	208	208	240	240	277	277	480	480		120	208	208	240	240	277	480	480
Amps	Maximum lenghts of wire at 3% voltage drop in feet																Maximum lenghts of wire at 3% voltage drop in feet																	
1	2313.6	2356.0	4010.3	4083.8	4630.7	4715.5	4627.2	4712.0	5343.1	5441.0	5340.6	5438.5	9254.5	9424.1	10686.2	10882.0	3666.0	6354.4	7337.4	7332.0	8466.2	8462.3	9771.4	14654.0	16932.5		5844.2	10129.9	11697.0	11688.3	13496.5	13490.3	23376.6	26993.0
2	1156.8	1178.0	2005.1	2041.9	2315.3	2357.8	2313.6	2356.0	2671.5	2720.5	2670.3	2719.2	4627.2	4712.0	5343.1	5441.0	1833.0	3177.2	3668.7	3666.0	4233.1	4231.2	4885.7	7332.0	8466.2		2922.1	5064.9	5848.5	5844.2	6748.2	6745.1	11688.3	13496.5
3	771.2	785.3	1336.8	1361.3	1543.6	1571.8	1542.4	1570.7	1781.0	1813.7	1780.2	1812.8	3084.8	3141.4	3562.1	3627.3	1222.0	2118.1	2445.8	2444.0	2822.1	2820.8	3257.1	4888.0	5644.2		1948.1	3376.6	3899.0	3896.1	4498.8	4496.8	7792.2	8997.7
4	578.4	589.0	1002.6	1020.9	1157.7	1178.9	1156.8	1178.0	1335.8	1360.2	1335.2	1359.6	2313.6	2356.0	2671.5	2720.5	916.5	1588.6	1834.4	1833.0	2116.6	2115.6	2442.9	3666.0	4233.1		1461.0	2532.5	2924.2	2922.1	3374.1	3372.6	5844.2	6748.2
5	462.7	471.2	802.1	816.8	926.1	943.1	925.4	942.4	1068.6	1088.2	1068.1	1087.7	1850.9	1884.8	2137.2	2176.4	733.2	1270.9	1467.5	1466.4	1693.2	1692.5	1954.3	2933.8	3386.5		1168.8	2026.0	2339.4	2337.7	2699.3	2698.1	4675.3	5398.6
6	385.6	392.7	668.4	680.6	771.8	785.9	771.2	785.3	890.5	906.8	890.1	906.4	1542.4	1570.7	1781.0	1813.7	611.0	1059.1	1222.9	1222.0	1411.0	1410.4	1628.6	2444.0	2822.1		974.0	1688.3	1949.5	1948.1	2249.4	2248.4	3896.1	4498.8
7	330.5	336.6	572.9	583.4	661.5	673.6	661.0	673.1	763.3	777.3	762.9	776.9	1322.1	1346.3	1526.6	1554.6	523.7	907.8	1048.2	1047.4	1209.5	1208.9	1395.9	2094.9	2418.9		834.9	1447.1	1671.0	1669.8	1928.1	1927.2	3339.5	3856.1
8	289.2	294.5	501.3	510.5	578.8	589.4	578.4	589.0	667.9	680.1	667.6	679.8	1156.8	1178.0	1335.8	1360.2	458.2	794.3	917.2	916.5	1058.3	1057.8	1221.4	1833.0	2116.6		730.5	1266.2	1462.1	1461.0	1687.1	1686.3	2922.1	3374.1
9	257.1	261.8	445.6	453.8	514.5	523.9	514.1	523.6	593.7	604.6	593.4	604.3	1028.3	1047.1	1187.4	1209.1	407.3	706.0	815.3	814.7	940.7	940.3	1085.7	1629.3	1881.4		649.4	1125.5	1299.7	1298.7	1499.6	1498.9	2597.4	2999.2
10	231.4	235.6	401.0	408.4	463.1	471.6	462.7	471.2	534.3	544.1	534.1	543.8	925.4	942.4	1068.6	1088.2	366.6	635.4	733.7	733.2	846.6	846.2	977.1	1466.4	1693.2		584.4	1013.0	1169.7	1168.8	1349.6	1349.0	2337.7	2699.3
15	154.2	157.1	267.4	272.3	308.7	314.4	308.5	314.1	356.2	362.7	356.0	362.6	617.0	628.3	712.4	725.5	244.4	423.6	489.2	488.8	564.4	564.2	651.4	977.6	1128.8		389.6	675.3	779.8	779.2	899.8	899.4	1558.4	1799.5
16	144.6	147.3	250.6	255.2	289.4	294.7	289.2	294.5	333.9	340.1	333.8	339.9	578.4	589.0	667.9	680.1	229.1	397.1	458.6	458.2	529.1	528.9	610.7	916.5	1058.3		365.3	633.1	731.1	730.5	843.5	843.1	1461.0	1687.1
17	136.1	138.6	235.9	240.2	272.4	277.4	272.2	277.2	314.3	320.1	314.2	319.9	544.4	554.4	628.6	640.1	215.6	373.8	431.6	431.3	498.0	497.8	574.8	862.6	996.0		343.8	595.9	688.1	687.5	793.9	793.5	1375.1	1587.8
18	128.5	130.9	222.8	226.9	257.3	262.0	257.1	261.8	296.8	302.3	296.7	302.1	514.1	523.6	593.7	604.6	203.7	353.0	407.6	407.3	470.3	470.1	542.9	814.7	940.7		324.7	562.8	649.8	649.4	749.8	749.5	1298.7	1499.6
19	121.8	124.0	211.1	214.9	243.7	248.2	243.5	248.0	281.2	286.4	281.1	286.2	487.1	496.0	562.4	572.7	192.9	334.4	386.2	385.9	445.6	445.4	514.3	771.8	891.2		307.6	533.2	615.6	615.2	710.3	710.0	1230.3	1420.7
20	115.7	117.8	200.5	204.2	231.5	235.8	231.4	235.6	267.2	272.0	267.0	271.9	462.7	471.2	534.3	544.1	183.3	317.7	366.9	366.6	423.3	423.1	488.6	733.2	846.6		292.2	506.5	584.8	584.4	674.8	674.5	1168.8	1349.6
25	92.5	94.2	160.4	163.4	185.2	188.6	185.1	188.5	213.7	217.6	213.6	217.5	370.2	377.0	427.4	435.3	146.6	254.2	293.5	293.3	338.6	338.5	390.9	586.6	677.3		233.8	405.2	467.9	467.5	539.9	539.6	935.1	1079.7
30	77.1	78.5	133.7	136.1	154.4	157.2	154.2	157.1	178.1	181.4	178.0	181.3	308.5	314.1	356.2	362.7	122.2	211.8	244.6	244.4	282.2	282.1	325.7	488.8	564.4		194.8	337.7	389.9	389.6	449.9	449.7	779.2	899.8
35	66.1	67.3	114.6	116.7	132.3	134.7	132.2	134.6	152.7	155.5	152.6	155.4	264.4	269.3	305.3	310.9	104.7	181.6	209.6	209.5	241.9	241.8	279.2	419.0	483.8		167.0	289.4	334.2	334.0	385.6	385.4	667.9	771.2
40	57.8	58.9	100.3	102.1	115.8	117.9	115.7	117.8	133.6	136.0	133.5	136.0	231.4	235.6	267.2	272.0	91.6	158.9	183.4	183.3	211.7	211.6	244.3	366.6	423.3		146.1	253.2	292.4	292.2	337.4	337.3	584.4	674.8
45	51.4	52.4	89.1	90.8	102.9	104.8	102.8	104.7	118.7	120.9	118.7	120.9	205.7	209.4	237.5	241.8	81.5	141.2	163.1	162.9	188.1	188.1	217.1	325.9	376.3		129.9	225.1	259.9	259.7	299.9	299.8	519.5	599.8
50	46.3	47.1	80.2	81.7	92.6	94.3	92.5	94.2	106.9	108.8	106.8	108.8	185.1	188.5	213.7	217.6	73.3	127.1	146.7	146.6	169.3	169.2	195.4	293.3	338.6		116.9	202.6	233.9	233.8	269.9	269.8	467.5	539.9
60	38.6	39.3	66.8	68.1	77.2	78.6	77.1	78.5	89.1	90.7	89.0	90.6	154.2	157.1	178.1	181.4	61.1	105.9	122.3	122.2	141.1	141.0	162.9	244.4	282.2		97.4	168.8	194.9	194.8	224.9	224.8	389.6	449.9
70																	52.4	90.8	104.8	104.7	120.9	120.9	139.6	209.5	241.9		83.5	144.7	167.1	167.0	192.8	192.7	334.0	385.6
80																	45.8	79.4	91.7	91.6	105.8	105.8	122.1	183.3	211.7		73.1	126.6	146.2	146.1	168.7	168.6	292.2	337.4
90																											64.9	112.6	130.0	129.9	150.0	149.9	259.7	299.9
100																											58.4	101.3	117.0	116.9	135.0	134.9	233.8	269.9

BRANCH CIRCUIT VOLTAGE DROP CALCULATION

$$VD = \frac{2 \times L \times R \times I}{1000}$$

VD = VOLTAGE DROP
V = VOLTAGE
L = ONE WAY LENGTH OF CONDUCTOR
R = CONDUCTOR RESISTANCE IN OHMS PER THOUSAND FEET
I = LOAD CURRENT (AMPERES)

NOTICE TO CONTRACTOR:
THIS BRANCH CIRCUIT VOLTAGE DROP SCHEDULE IS TO BE USED WHEN SIZING CONDUCTORS FOR ACTUAL INSTALLED FIELD CONDITION CIRCUIT LENGTHS. SPECIFIC CONDUCTOR SIZING ON PLANS SHALL BE THE MINIMUM SIZE CONDUCTOR USED FOR INSTALLATION UNLESS INSTALLED CONDITION EXCEEDS CIRCUIT LENGTH ALLOWED ON TABLE AND SHALL BE INCREASED TO THE NEXT SIZE CONDUCTOR SCHEDULED. ALL CONDUCTORS AS DESIGNED OR AS REQUIRED PER INSTALLED CONDITION IS PART OF THE CONTRACTORS BASE BID.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHIEN HSING FANG
No. E 16592
ELECTRICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 06-24-2024

SHEET TITLE:

BRANCH CIRCUIT VOLTAGE DROP CALCULATIONS

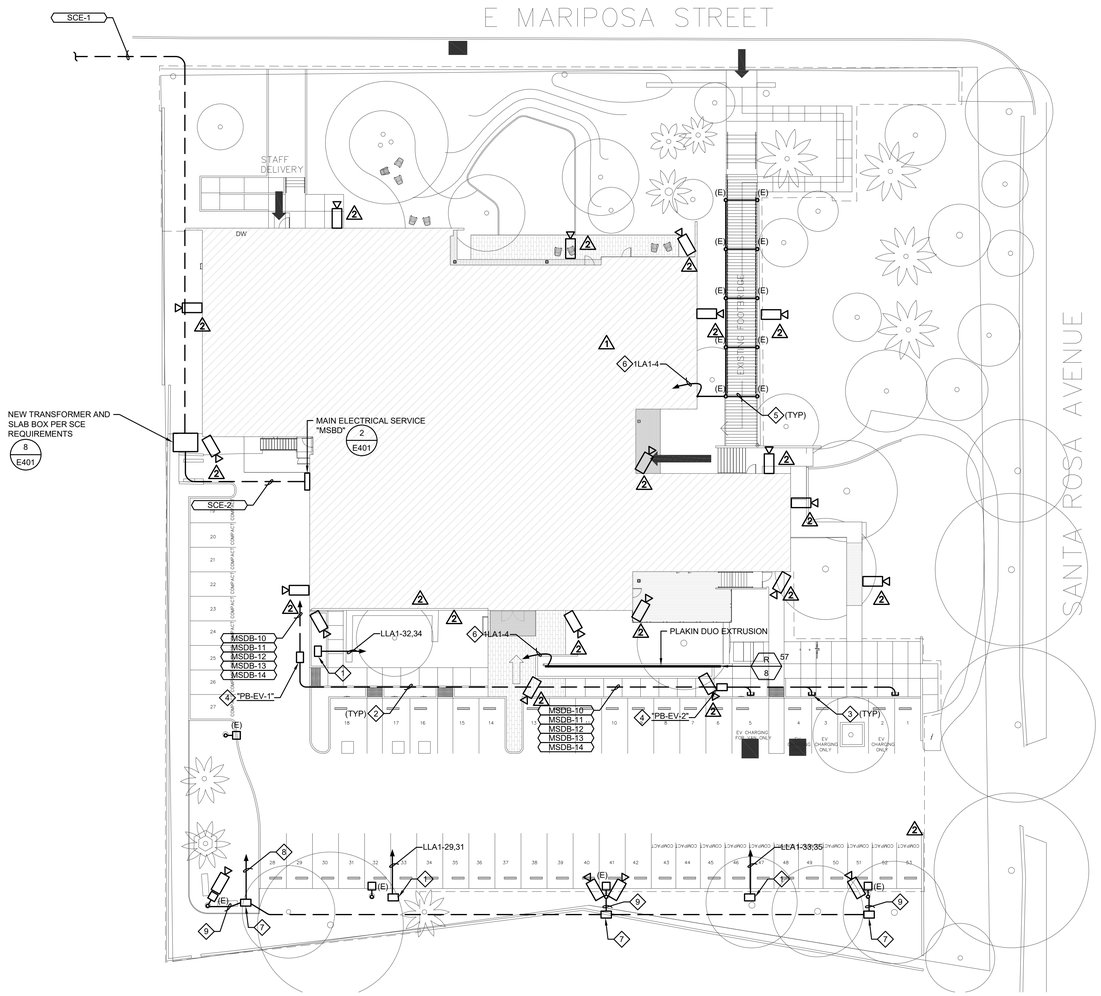
SCALE: NTS 1'-0"

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0577
Fax 909.980.7023

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E005

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E005.dwg 7-21-25-12:30 PM



1 ELECTRICAL SITE PLAN
1" = 20'-0"

SHEET NOTES

1. PROVIDE AND INSTALL LEGRAND NEMA 3R POWER PEDESTAL WITH HINGED COVER #XPP1G30C-BK AND NEMA TYPE L6-50 R WATERTIGHT RECEPTACLE. PROVIDE A MINIMUM 8" ROUND CONCRETE BASE FOR MOUNTING. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
2. SAWCUT, TRENCH, AND EXCAVATE AS REQUIRED TO INSTALL CONDUIT FEEDERS AS INDICATED. BACKFILL, TAMP, AND RESURFACE TO ORIGINAL CONDITION. POTHOLE AND HAND DIG AS REQUIRED. PROVIDE ALL NECESSARY SHORING FOR INSTALLATION.
3. STUB-OUT FOR FUTURE EV CHARGING STATION. VERIFY EXACT LOCATION WITH THE ARCHITECT PRIOR TO INSTALLATION.
4. PROVIDE AND INSTALL 2'x3'xDEPTH REQUIRED PRECAST CONCRETE PULLBOX WITH TRAFFIC RATED RATED HEAVY DUTY BOLT-DOWN COVER ENGRAVED "EV CHARGING". SET FLUSH WITH GRADE ON 6" COMPACTED CRUSHED ROCK.
5. ROUTE CONDUIT EXPOSED ON THE UNDERSIDE OF THE FOOT BRIDGE.
6. ROUTE HOMERUN VIA "LCP-1" FOR CIRCUIT CONTROL.
7. PROVIDE AND INSTALL 1'x2'xDEPTH REQUIRED PRECAST CONCRETE PULLBOX WITH TRAFFIC RATED RATED HEAVY DUTY BOLT-DOWN COVER ENGRAVED "CCTV". SET FLUSH WITH GRADE ON 6" COMPACTED CRUSHED ROCK.
8. 1"CONDUIT WITH (4) OUTDOOR RATED CAT 6 CABLES FOR CAMERAS. ROUTE CONDUIT TO DATA ROOM.
9. PROVIDE AND INSTALL 1" CONDUIT WITH CAT 6 CABLE UP POLE AND BACKBOX FOR CAMERA TO 15'-0" AFF. PAINT CONDUIT TO MATCH POLE COLOR.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHIEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

ELECTRICAL SITE PLAN

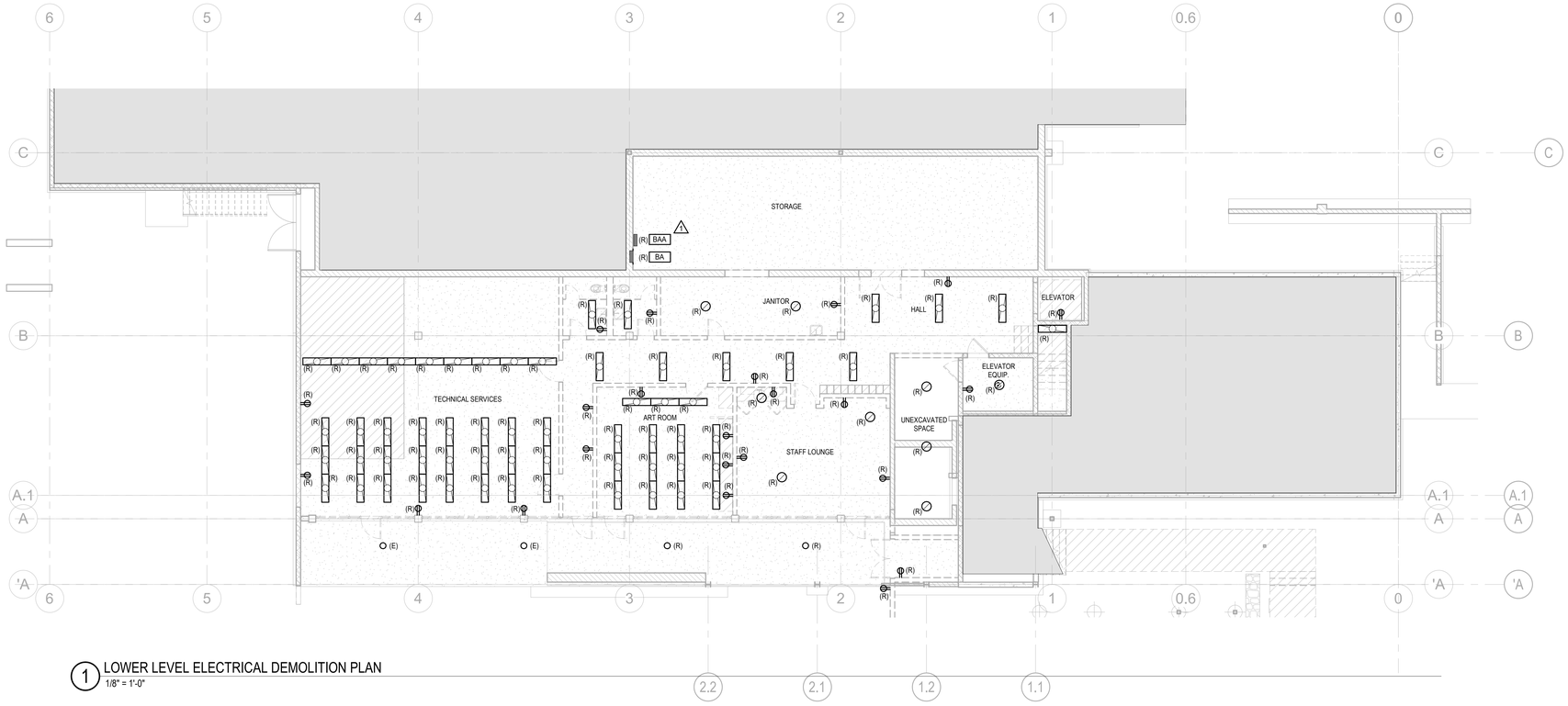
SCALE: N/B~~T~~S 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0317
Fax 909.980.7023

E111

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E111.dwg 7-21-25-12:30 PM



1 LOWER LEVEL ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

LOWER LEVEL ELECTRICAL DEMOLITION PLAN

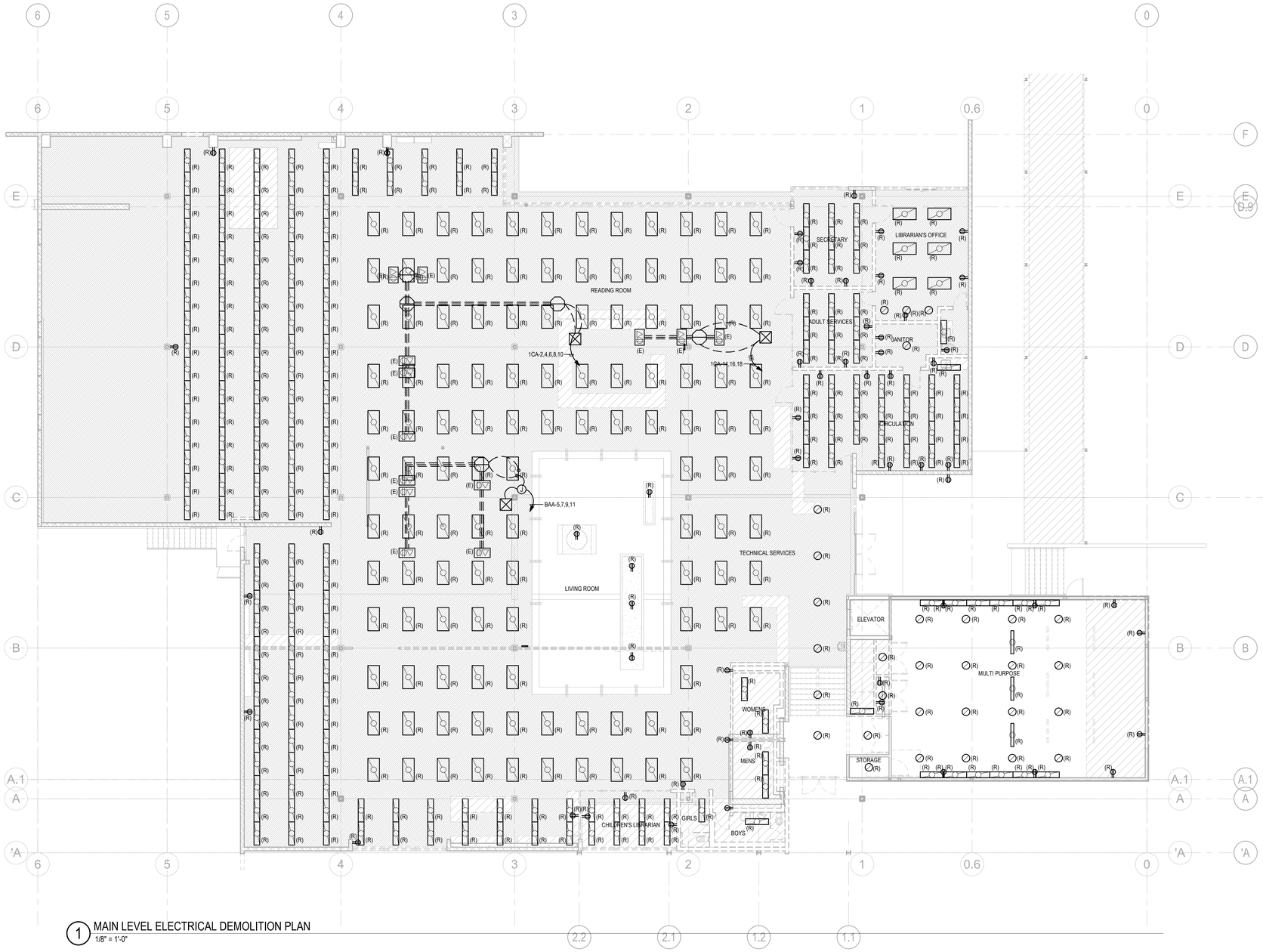
SCALE: 1/8" = 1'-0"

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax.909.980.7023

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E200

7/21/2025 12:19:29 PM



1 MAIN LEVEL ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"

SHEET NOTES

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHEN HSING TANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

MAIN LEVEL ELECTRICAL DEMOLITION PLAN

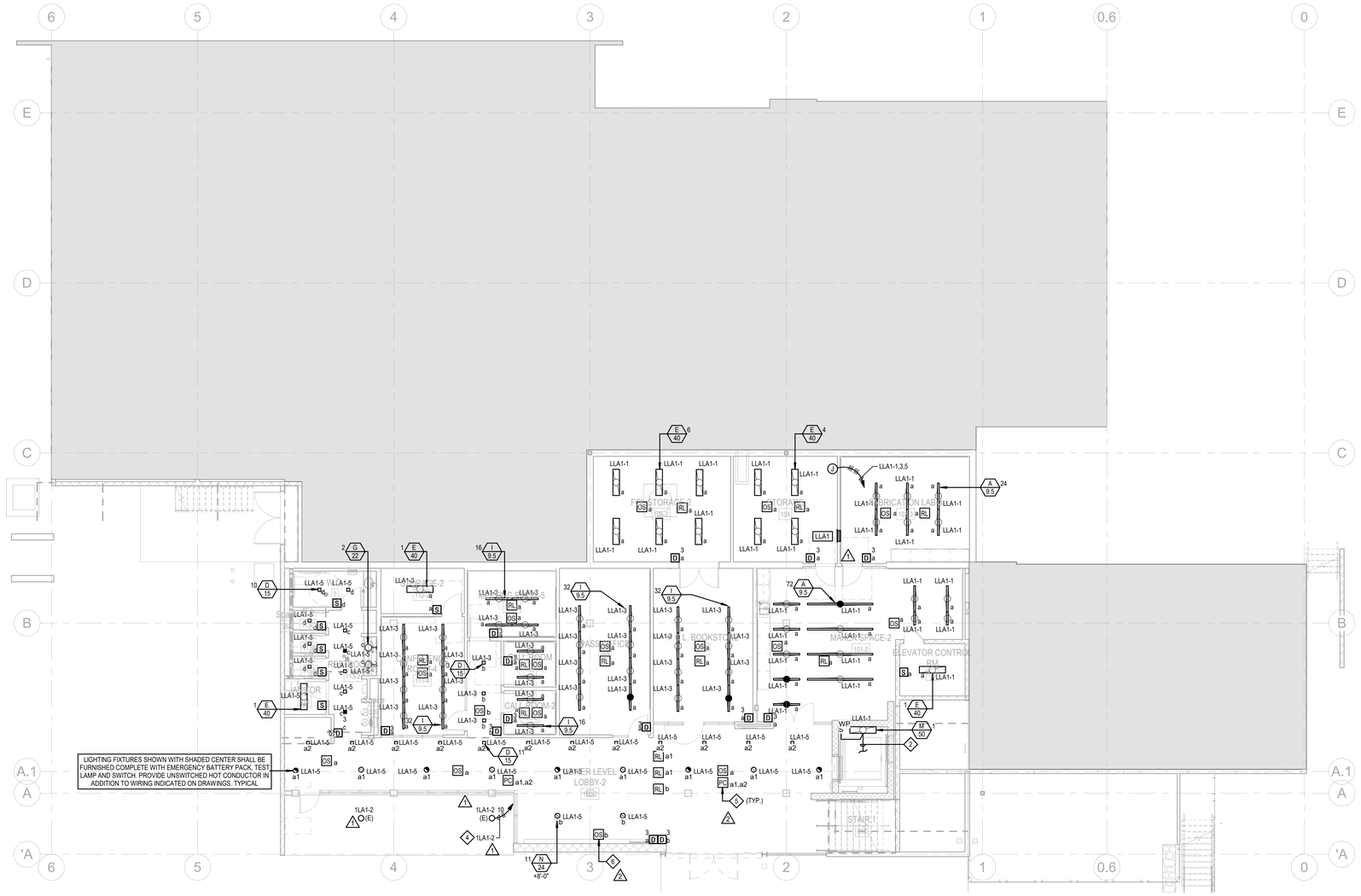
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brule Architects and may not be duplicated without the written consent of Anderson-Brule Architects. ©

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

E201

7/21/2025 12:19:36 PM



1 LOWER LEVEL LIGHTING PLAN
1/8" = 1'-0"

CIRCUITING NOTE:

CIRCUITS SHOWN ON HOMERUNS SHALL BE EXTENDED TO LIGHT FIXTURES WHERE CIRCUITS ARE IDENTIFIED. PROVIDE SWITCHING AS SHOWN ON THE DRAWINGS. ALL CONDUCTORS SHALL BE ROUTED IN CONDUIT. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONDUIT, BOXES, CONDUCTORS, SUPPORTS, ETC. REQUIRED FOR A COMPLETE INSTALLATION. REFER TO THE SPECIFICATIONS FOR MINIMUM CONDUIT AND CONDUCTOR REQUIREMENTS.

SHEET NOTES

1. MOUNT LIGHT FIXTURES UNDER CABINETS. COORDINATE LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
2. LIGHT FIXTURE SHALL BE MOUNTED ON TOP OF GYP SHELF. REFER TO DETAIL #12/A807 FOR LOCATION.
3. MAKE CONNECTION TO RECEPTACLE FOR POWER.
4. ROUTE HOMERUN VIA "LCP-1" FOR CIRCUIT CONTROL. REFER TO SHEET E203 FOR "LCP-1" LOCATION.
5. LIGHTING CONTROL DEVICES IN THE LOBBY AREA SHALL BE INSTALLED IN THE SOFFIT.
6. PROVIDE WALL MOUNTED DEVICE AT THIS LOCATION.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHEN HSING FANG No. E 16502 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
	Date 3	BACKCHECK#2 MEP BLD PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

LOWER LEVEL LIGHTING PLAN

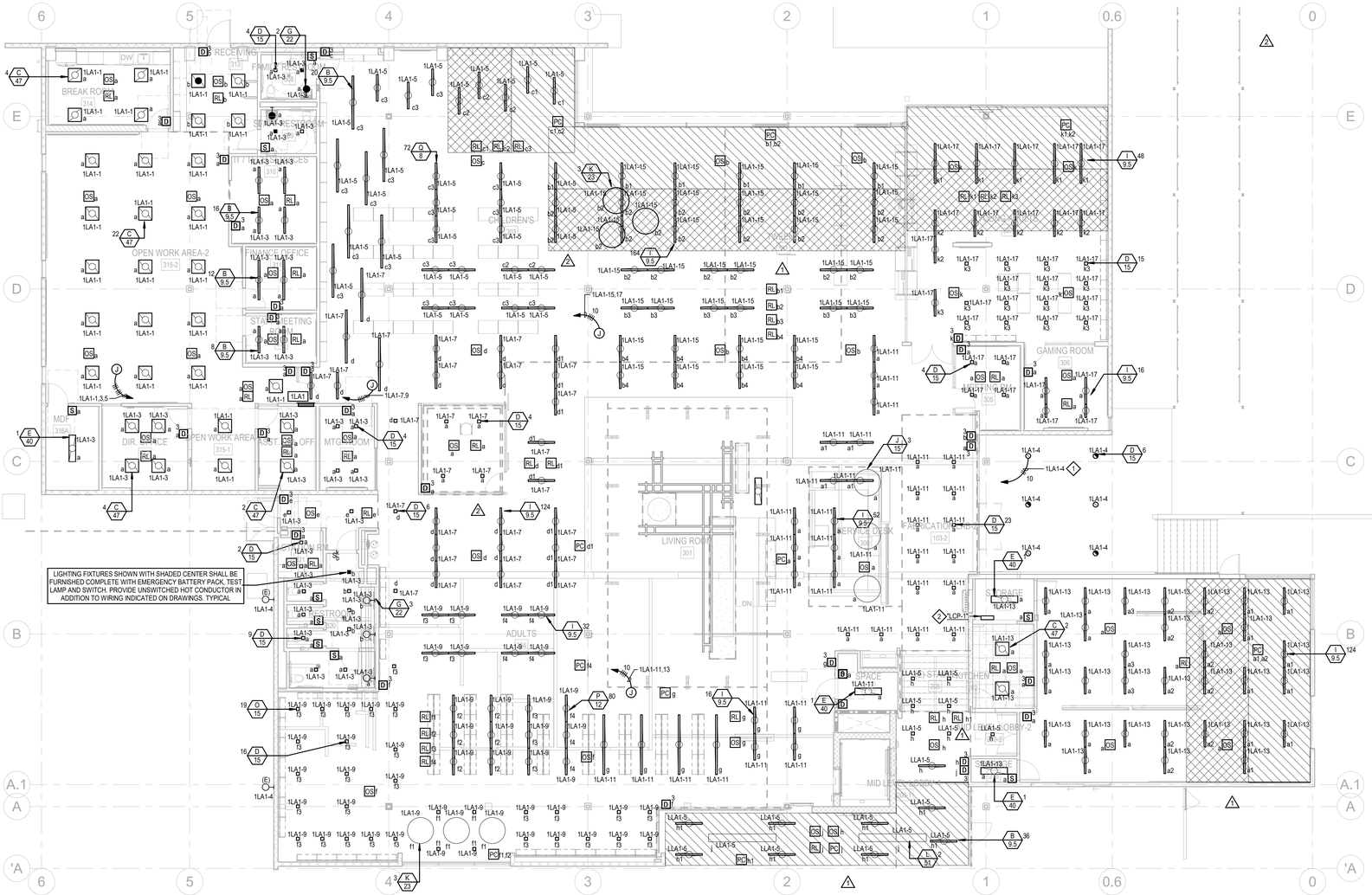
SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023

E202

7/21/2025 12:19:43 PM



SHEET NOTES

1. ROUTE HOMERUN VIA "LCP-1" FOR CIRCUIT CONTROL.
2. REFER TO SHEET E403 FOR LIGHTING CONTROL PANEL MANUFACTURE AND MODEL NUMBER.

CIRCUITING NOTE:

CIRCUITS SHOWN ON HOMERUNS SHALL BE EXTENDED TO LIGHT FIXTURES WHERE CIRCUITS ARE IDENTIFIED. PROVIDE SWITCHING AS SHOWN ON THE DRAWINGS. ALL CONDUCTORS SHALL BE ROUTED IN CONDUIT. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONDUIT, BOXES, CONDUCTORS, SUPPORTS, ETC. REQUIRED FOR A COMPLETE INSTALLATION. REFER TO THE SPECIFICATIONS FOR MINIMUM CONDUIT AND CONDUCTOR REQUIREMENTS.

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
	Date 3	BACKCHECKK2 MEP BLD PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

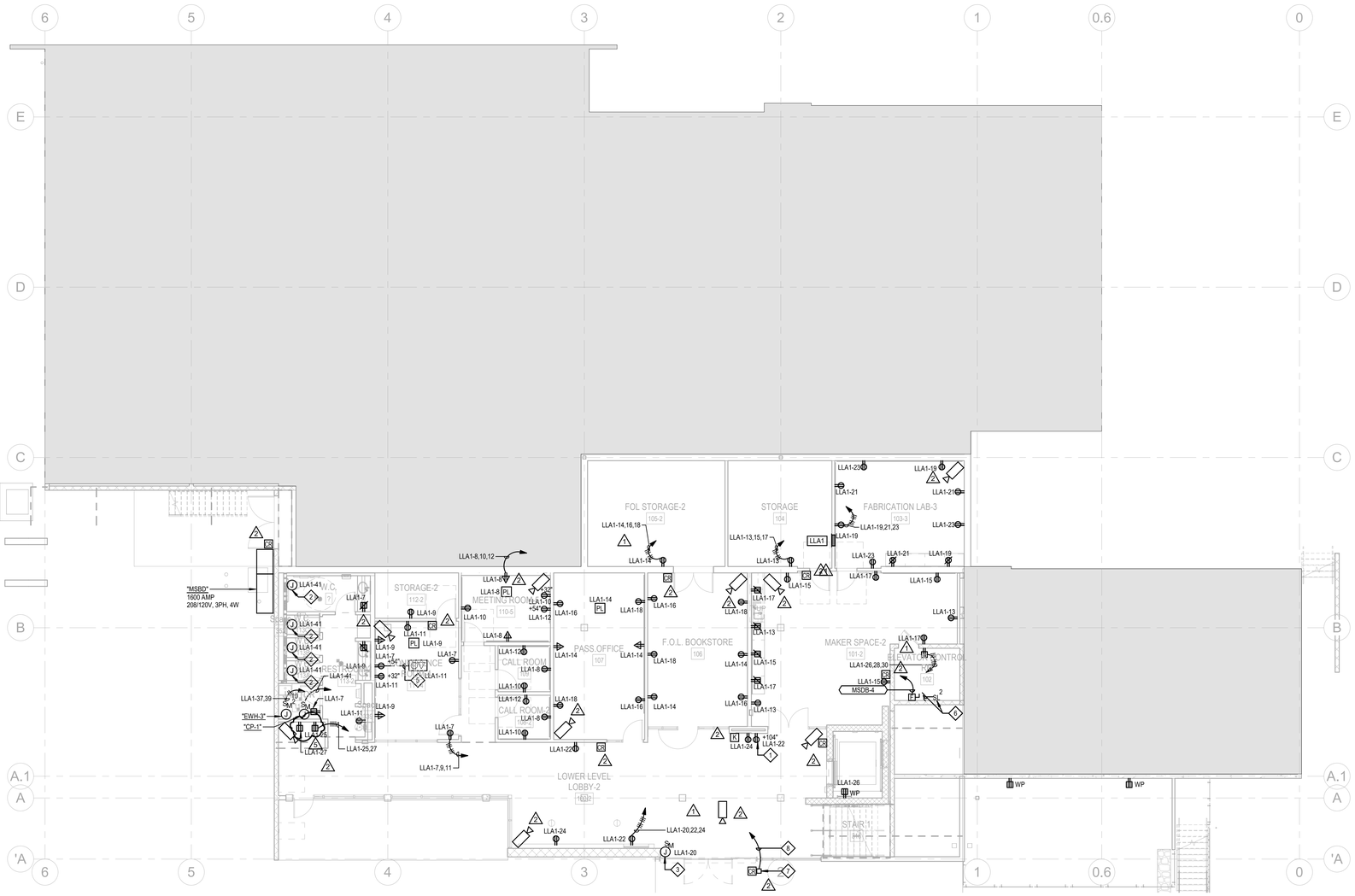
MAIN LEVEL LIGHTING PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E203

7/21/2025 12:19:55 PM



1 LOWER LEVEL POWER PLAN
1/8" = 1'-0"

SHEET NOTES

1. RECEPTACLE FOR DISPLAY MONITOR. VERIFY EXCACT LOCATION WITH THE ARCHITECT PRIOR TO ROUGH-IN. TYPICAL.
2. MAKE CONNECTION TO AUTOMATIC FLUSH VALVE.
3. MAKE CONNECTION TO SLIDING DOORS PER MANUFACTURES REQUIREMENTS. VERIY EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
4. FOR DRINKING FOUNTAIN. VERIFY EXACT LOCATION WITH PLUMBING CONTRACTOR PRIOR TO INSTALLATION.
5. UNDERGROUND CONDUIT SHALL BE ROUTED WHERE SLAB IS BEING SAWCUT.
6. EXTEND (2) DEDICATED 120V. CIRCUITS TO ELEVATOR CONTROLLER VIA LOCABLE TOGGLE SWITCH.
7. PROVIDE AND INSTALL PEDESTAL FOR CARD READER. PEDESTAL SHALL EQUAL TO PEDESTAL PRO #ADA-SS-TWR-47X4X4. PROVIDE ALL ADDITIONAL COMPONENTS AS REQUIRED FOR A COMPLETE INSTALLATION.
8. ROUTE A 1"C.O. TO DATA ROOM AND STUB UP 6" AFF. COORDINATE STUB UP LOCATION WITH THE ACCESS CONTROL CONTRACTOR PRIOR TO INSTALLATION.

△2

CIRCUITING NOTE:

CIRCUITS SHOWN ON HOMERUNS SHALL BE EXTENDED TO DEVICES WHERE CIRCUITS ARE IDENTIFIED. ALL CONDUCTORS SHALL BE ROUTED IN CONDUIT. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONDUIT, BOXES, CONDUCTORS, SUPPORTS, ETC. REQUIRED FOR A COMPLETE INSTALLATION. REFER TO THE SPECIFICATIONS FOR MINIMUM CONDUIT AND CONDUCTOR REQUIREMENTS.

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHIEN HSING FANG
No. E 16592
ELECTRICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	Date 3	BACKCHECK#2 MEP BLD PERMIT SUBMITTAL
	7/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL
		BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL
		BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL
		BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL
		BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

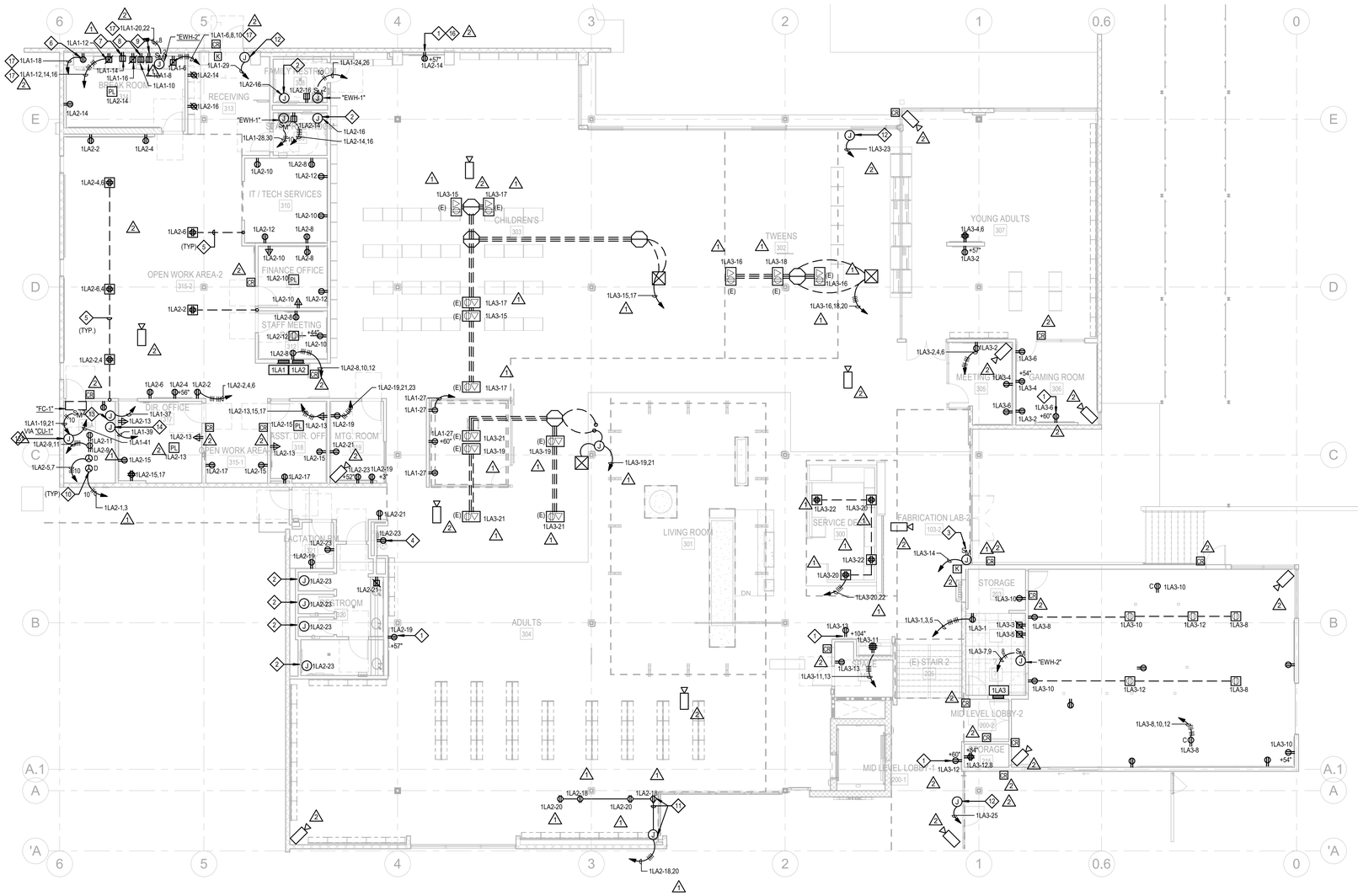
LOWER LEVEL POWER PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E204

7/21/2025 12:20:00 PM



1 MAIN LEVEL POWER PLAN
1/8" = 1'-0"

SHEET NOTES

1. RECEPTACLE FOR DISPLAY MONITOR. VERIFY EXCACT LOCATION WITH THE ARCHITECT PRIOR TO ROUGH-IN. TYPICAL.
2. MAKE CONNECTION TO AUTOMATIC FLUSH VALVE.
3. MAKE CONNECTION TO SLIDING DOORS PER MANUFACTURES REQUIREMENTS. VERIY EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
4. FOR DRINKING FOUNTAIN. VERIFY EXACT LOCATION WITH PLUMBING CONTRACTOR PRIOR TO INSTALLATION.
5. UNDERGROUND CONDUIT SHALL BE ROUTED WHERE SLAB IS BEING SAWCUT.
6. FOR REFRIGERATOR. VERIVY EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
7. FOR MICROWAVE. VERIFY LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
8. FOR DISHWASHER. VERIFY LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
9. LOCATE UNDER SINK FOR GARBAGE DISPOSAL PROVIDE WALL SWITCH AND ROUTE CIRCUIT VIA SWITH OF CONTROL. VERIFY STICHE LOCATION WITH THE ARCHITECT PRIOR TO INSTALLATION.
10. MOUNT RECEPTACLE TO TOP OF RACK.
11. PROVIDE LEGRAND COUNECTRAC FLEX RACEWAY SYSTEM AND DEVICES.
12. MAKE CONNECTION TO DOOR ACTUATOR PER MANUFACTURERS REQUIREMENTS. VERIFY EXACT LOCATION TO INSTALLATION.
13. FOR SECURITY ALARM PANEL.
14. FOR ACCESS CONTROL PANEL.
15. FOR FIRE ALARM CONTROL PANEL.
16. PAINT EXPOSED ONCUIT TO MATCH SURROUNDING FINISH.
17. CONDUIT SHALL BE ROUTED HORIZONTALLY IN FURRED OUT PORTION OF WALL TO AVOID CONFLICT WITH CLERE STORY.

CIRCUITING NOTE:

CIRCUITS SHOWN ON HOMERUNS SHALL BE EXTENDED TO DEVICES WHERE CIRCUITS ARE IDENTIFIED. ALL CONDUCTORS SHALL BE ROUTED IN CONDUIT. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONDUIT, BOXES, CONDUCTORS, SUPPORTS, ETC. REQUIRED FOR A COMPLETE INSTALLATION. REFER TO THE SPECIFICATIONS FOR MINIMUM CONDUIT AND CONDUCTOR REQUIREMENTS.

DCCA ENGINEERS
Consulting Mechanical and Electrical Engineers
4700 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHIEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
	Date 3	BACKCHECK#2 MEP BLD PERMIT SUBMITTAL
	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

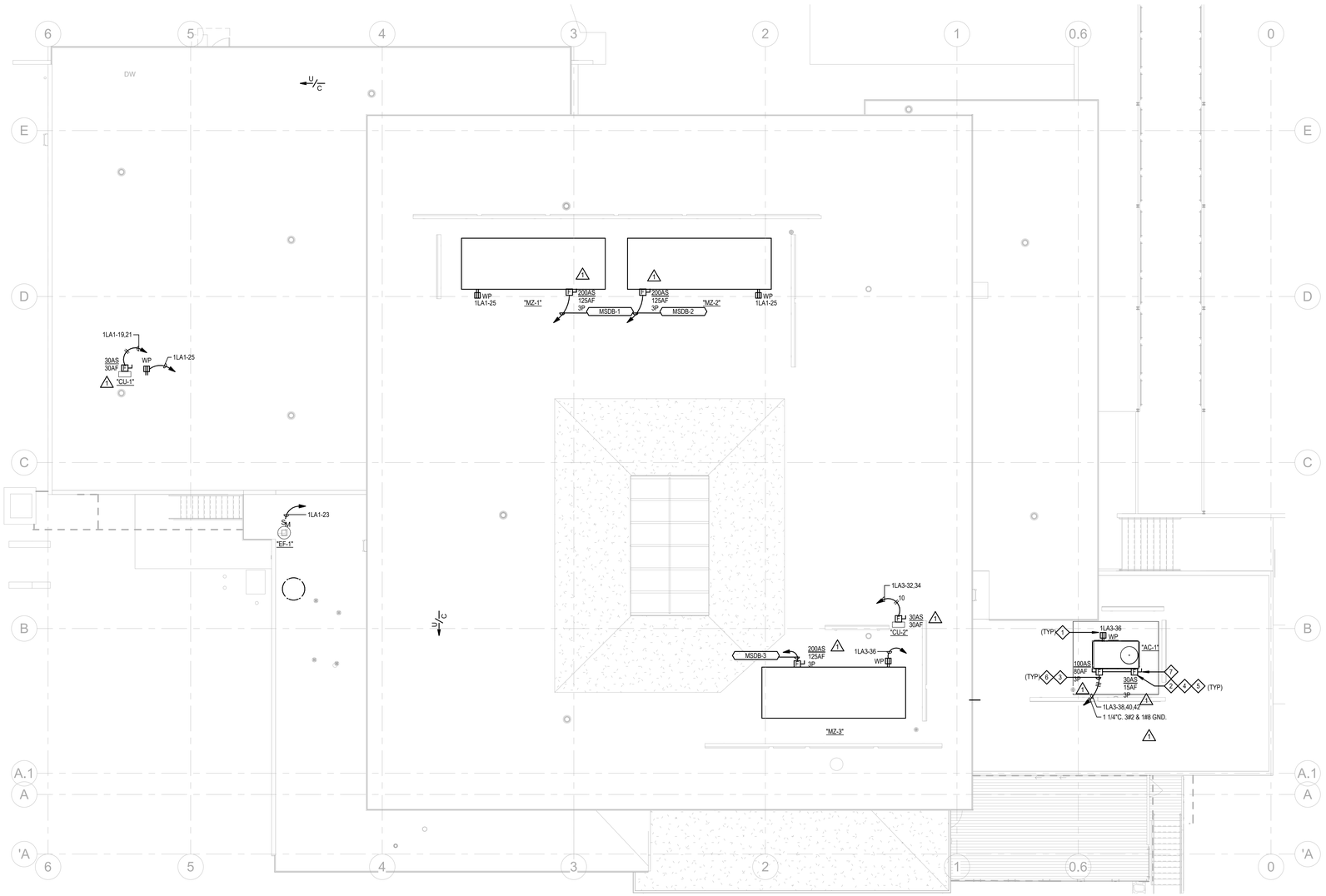
MAIN LEVEL POWER PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E205

7/21/2025 12:20:08 PM



1 ELECTRICAL ROOF PLAN
1/8" = 1'-0"

SHEET NOTES

1. ALL EQUIPMENT ON ROOF SHALL BE WEATHERPROOF. ALL BOXES, CONDUITS, SWITCHES, RECEPTACLES, ETC., SHALL BE WEATHERPROOF. SEAL ALL OPENINGS.
2. UNIT DISCONNECT SHALL BE MOUNTED TO MAINTAIN ALL CODE REQUIRED CLEARANCES. WHERE DISCONNECT IS MONTED ON A/C UNIT. MOUNT TO AVOID ACCESS PANELS.
3. ROUTE "SEAL TITE" CONDUIT FEEDERS TO RELATED DISCONNECT SWITCH AND/ RECEPTACLE, ETC.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR EXACT EQUIPMENT LOCATION AND ELECTRICAL CONNECTION POINTS TO ALL EQUIPMENT PRIOR TO ROUGH-IN. TYPICAL.
5. 30 AMP WEATHERPROOF FUSED DISCONNECT SWITCH WITH FUSES SIZED PER THE EQUIPMENT NAMEPALATE REQUIREMENTS, U.N.O. TYPICAL.
6. NO CONDUIT SHALL BE RUN EXPOED ON THE ROOF. FUN ALL CONDUIT IN CEILING SPACE AND STUB THROUGH ROOF AT CONNECTION POINT. VERIFY ROUGH-IN LOCATIONS WITH EQUIPMENT MANUFACTURER. TYPICAL.
7. DISCONNECT SWITCH FOR UNIT POWER EXHAUST. VERIFY EXACT LOCATION PRIOR TO INSTALLATION. REFER TO DETAIL #9/E4.1.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHIEN HSING FAN No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

ELECTRICAL ROOF PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

E206

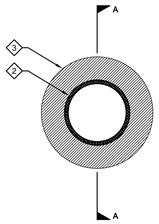
7/21/2025 12:20:14 PM

DETAIL NOTES:

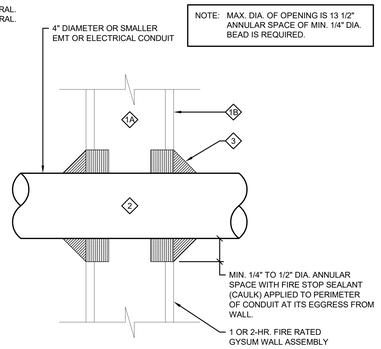
1. WALL CONSTRUCTION:
   A. STEEL STUDS PER ARCHITECTURAL/STRUCTURAL.
   B. 5/8" TYPE x GYPSUM BOARD PER ARCHITECTURAL.
2. CONDUIT SIZE PER DRAWINGS.
3. FIRE STOP SYSTEM - ONE HOUR CAULK. APPLY TO INTERFACE WITH WALL SURFACE.

U.L. SYSTEM NO. W-L-1001

NOTE: MAX. DIA. OF OPENING IS 13 1/2" ANNULAR SPACE OF MIN. 1/4" DIA. BEAD IS REQUIRED.



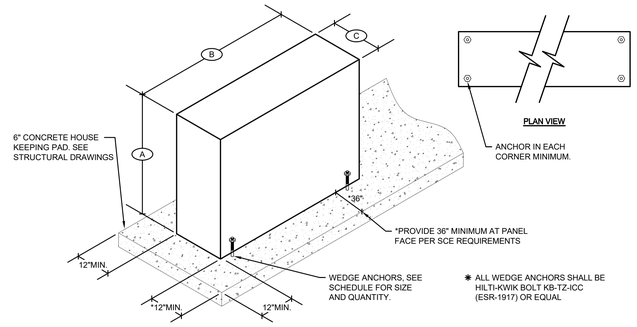
FRONT VIEW



SECTION A-A

CONDUIT PENETRATION AT 1-HR FIRE RATED WALL

NOT TO SCALE | 1

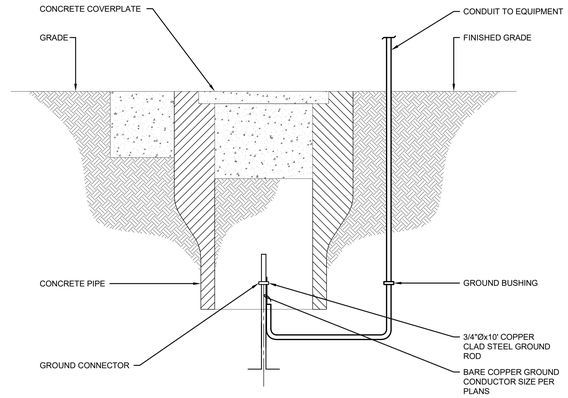


✱ ALL WEDGE ANCHORS SHALL BE HILTI-KWIK BOLT KB-TZ-ICC (ESR-1917) OR EQUAL

SYMBOL	A	B	C	WEIGHT	MIN. NO ANCHORS	SIZE OF ANCHORS	MINIMUM EMBEDMENT
"MSBD" (SECTION 1)	93"	45"	36"	800	4	1/2Ø	3 1/4"
"MSBD" (SECTIONS 2 AND 3)	93"	36"	36"	822	4	1/2Ø	3 1/4"

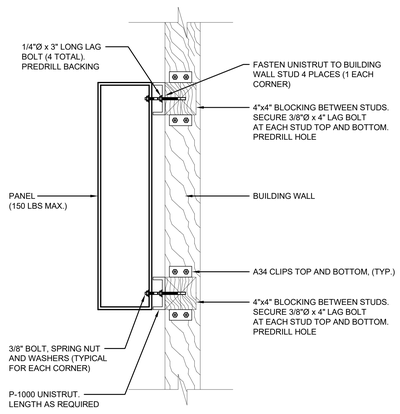
SWITCHBOARD MOUNTING DETAIL

NOT TO SCALE | 2



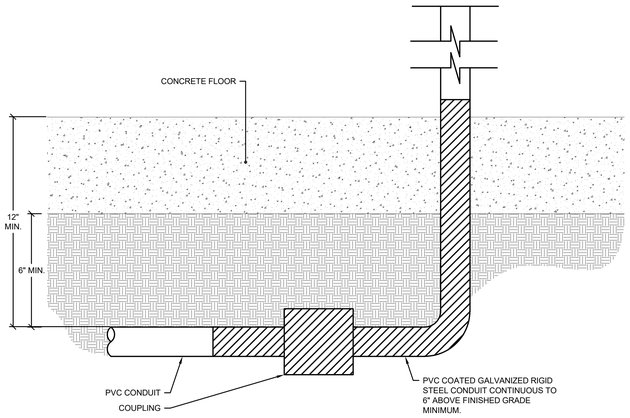
GROUND ROD DETAIL

NOT TO SCALE | 3



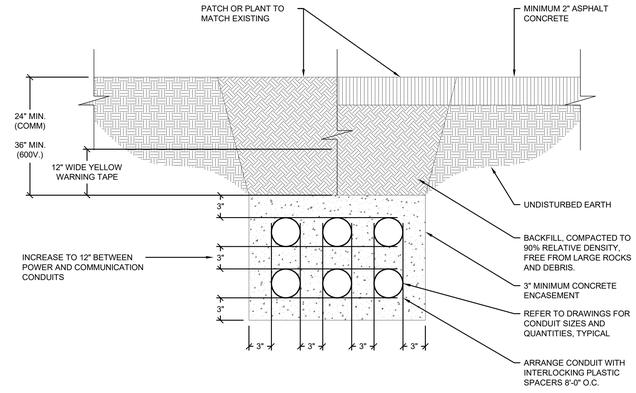
SURFACE MOUNTED PANEL/CABINET AT WOOD FRAMING

NOT TO SCALE | 4



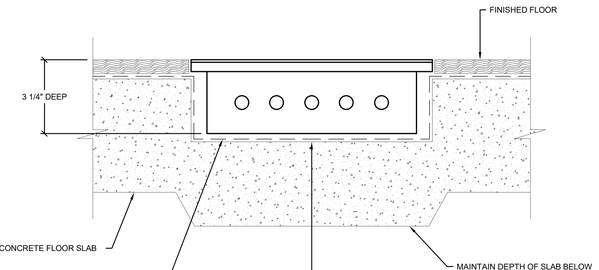
CONDUIT INSTALLED BELOW GRADE TO ABOVE GRADE DETAIL

NOT TO SCALE | 5



TYPICAL MULTI-CONDUIT PLACEMENT DETAIL

NOT TO SCALE | 6

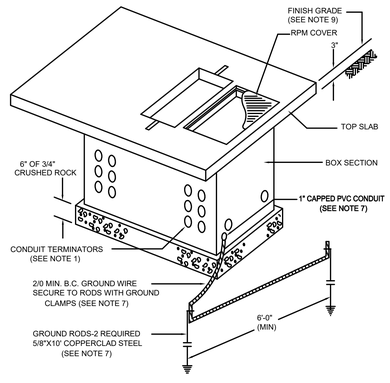


FLOOR BOX MOUNTING DETAIL

NOT TO SCALE | 7

1. CONDUIT TERMINATORS TO BE LOCATED AS SHOWN ON SS 535.2 TO 535.5. STANDARD CONDUIT ENTERANCE SHALL BE A FLATWALL DESIGN. SLIGHT VARIATIONS BY MANUFACTURERS MAY BE ALLOWED WITH COMPANY APPROVAL.
2. WHEN CABLE TRENCH OPENINGS ARE REQUIRED IN A SLAB BOX, THEY CAN BE SPECIAL ORDERED FROM THE CONCRETE PRECASTER.
3. FOR SLAB BOX STRUCTURAL DESIGN CRITERIA, SEE SS 535.2, 535.3, 535.4 AND 535.5.
4. FOR LIST OF MATERIAL REQUIREMENTS AND NOTES, SEE SS 535.6.
5. CONSULT MANUFACTURERS INSTALLATION GUIDES FOR EXCAVATION DIMENSIONS.
6. AN EIGHT-FOOT MINIMUM CLEARANCE IS REQUIRED DIRECTLY IN FRONT OF TRANSFORMER FOR OPERATION.
7. GROUND RODS, CLAMPS, AND WIRE WILL BE FURNISHED BY CONTRACTOR. SEE SS 703 FOR APPROVED GROUNDING MATERIALS. GROUND WIRE TO BE A MINIMUM OF 2/0 BARE COPPER. GROUND WIRE TO BE PLACED THROUGH CAPPED ONE-INCH PVC CONDUIT AT EITHER END OF SLAB BOX. A MINIMUM THREE-FOOT LENGTH OF GROUND WIRE SHALL BE PLACED IN SLAB BOX. (SHALL BE 25 OHMS MINIMUM OR LESS PER SCE REQUIREMENTS.)
8. MASTIC SEALANT IS REQUIRED AT JOINTS.
9. TOP SURFACE OF SLAB BOX SHALL BE SET THREE INCHES ABOVE FINISHED GRADE.
10. SEE SS 500 FOR APPROVED MANUFACTURERS.

* ALL REFERENCES TO "SS" INDICATES S.C.E.



10'x12' SLAB BOX DETAIL

NOT TO SCALE | 8

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHIEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

ELECTRICAL DETAILS

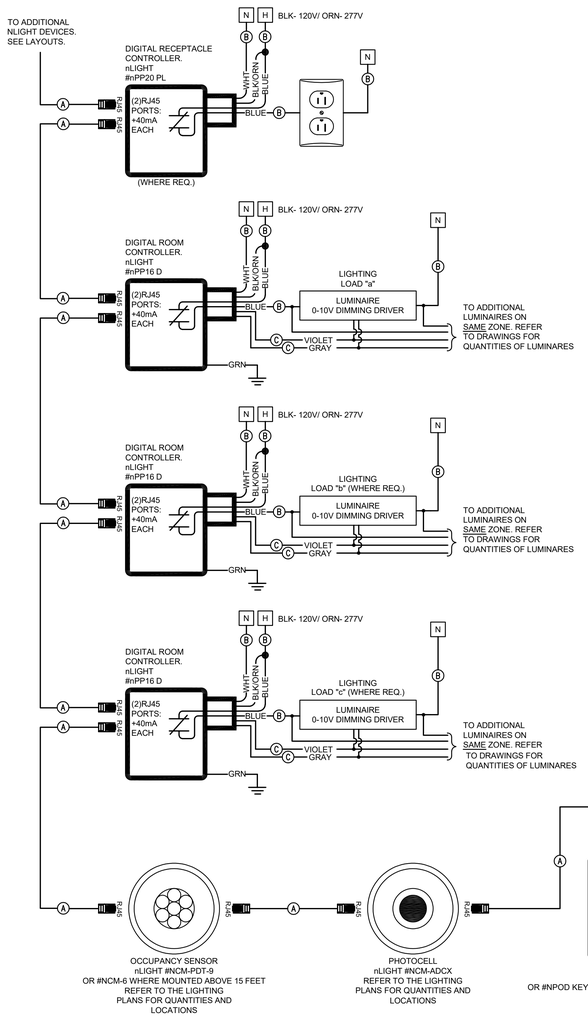
SCALE: NTS 1'-0"

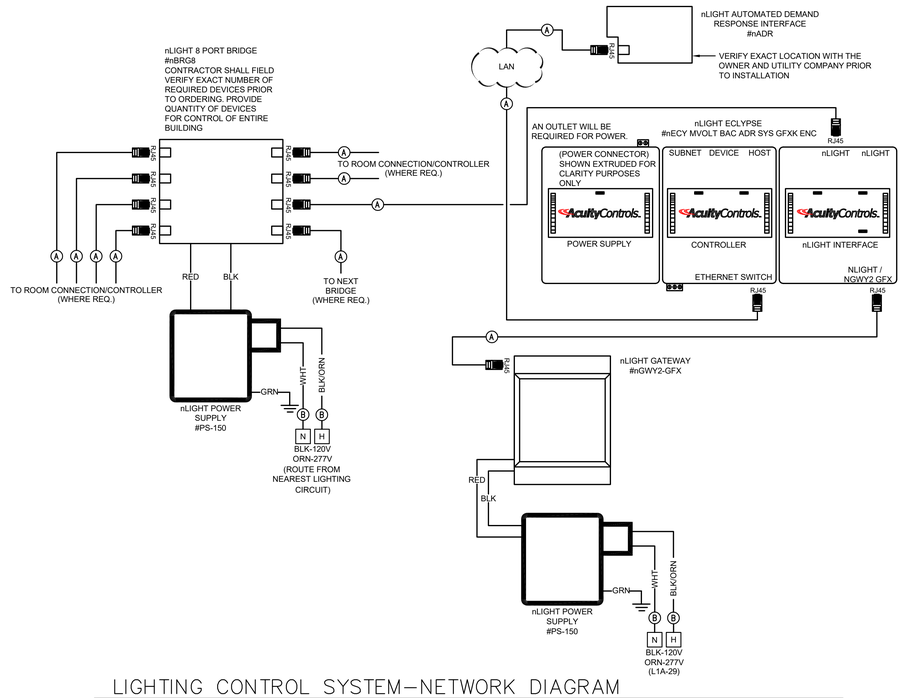
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E401

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4755 E. Ontario Mills Pkwy
Ontario, CA 91764
Phone 909.987.0017
Fax 909.980.7223

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E401.dwg 7-21-25-12:30 PM





LIGHTING CONTROL SYSTEM—NETWORK DIAGRAM

WALL SWITCH BUTTON ASSIGNMENTS (3 BUTTON SWITCH)		
BUTTON	ENGRAVING	ASSIGNMENTS
1	"ON/OFF"	ALL LIGHTS "ON" OR "OFF"
2	▲	RAISE LIGHT LEVELS INCREMENTALLY
3	▼	LOWER LIGHT LEVELS INCREMENTALLY

WALL SWITCH BUTTON ASSIGNMENTS (1 BUTTON SWITCH)		
BUTTON	ENGRAVING	ASSIGNMENTS
1	"ON/OFF"	ALL LIGHTS "ON" OR "OFF"

WIRE LEGEND	
(A)	CAT 5-E (CLASS 2)
(B)	LINE VOLTAGE
(C)	0-10 VDC
H	UNSWITCHED HOT CONDUCTOR
N	NEUTRAL CONDUCTOR

ALL LIGHTING CONTROL COMPONENTS SHALL BE "nLIGHT" OR EQUAL BY LEVITON OR WATTSTOPPER

ALL LINE VOLTAGE AND 0-10 VOLT CONDUCTORS SHALL BE ROUTED IN 3/4" CONDUIT, MINIMUM

REFER TO THE LIGHTING PLANS FOR QUANTITES AND LOCATIONS OF ALL LIGHTING CONTROL DEVICES UNLESS NOTED OTHERWISE.

LIGHTING CONTROL WIRING DIAGRAMS

SCALE N.T.S.

1

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER — GREEN RISING FAMILY — No. E 16592 — ELECTRICAL — STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 06-24-2024

SHEET TITLE:

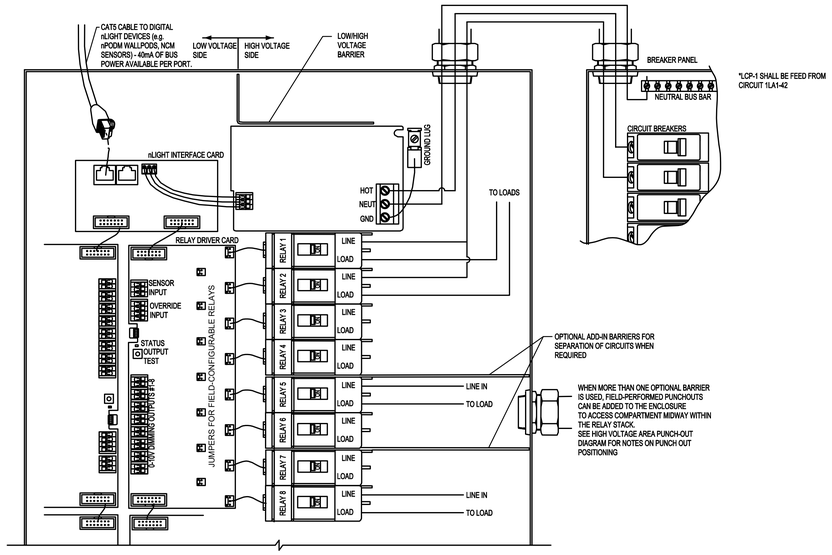
ELECTRICAL DETAILS

SCALE: N.T.S. 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

E402

DCCR ENGINEERS
Consulting Mechanical and Electrical Engineers
4710 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0717
Fax 909.980.7023



LIGHTING CONTROL PANEL "LCP-1"
ARP LIGHTING RELAY PANEL
MODEL #ARP INTENC16 16SPR MVOLT 2VB HLK SM

ALL EXTERIOR LIGHTING ROUTED VIA "LCP-1" SHALL BE CONTROLLED BY THE EMS SYSTEM. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR ALL INTEGRATION REQUIREMENTS FOR A COMPLETE SYSTEM.

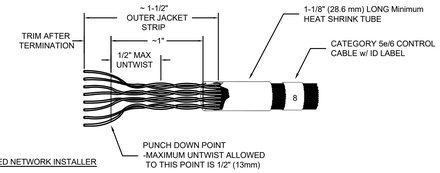
ALL LIGHTING CONTROL COMPONENTS SHALL BE "nLIGHT" OR EQUAL BY LEVITON OR WATTSTOPPER

ALL LINE VOLTAGE AND 0-10 VOLT CONDUCTORS SHALL BE ROUTED IN 3/4" CONDUIT, MINIMUM

REFER TO THE LIGHTING PLANS FOR QUANTITES AND LOCATIONS OF ALL LIGHTING CONTROL DEVICES UNLESS NOTED OTHERWISE.

TIA / EIA-568-B CABLING STANDARD TERMINATION

Function	PAIR #	PIN OUT (T568B)	Wire Color
(T1)	1	5	WHITE w/ BLUE
(R1)		4	BLUE
Tx + (T2)	2	1	WHITE w/ ORANGE
Tx - (R2)		2	ORANGE
Rx + (T3)	3	3	WHITE w/ GREEN
Rx - (R3)		6	GREEN
(T4)	4	7	WHITE w/ BROWN
(R4)		8	BROWN

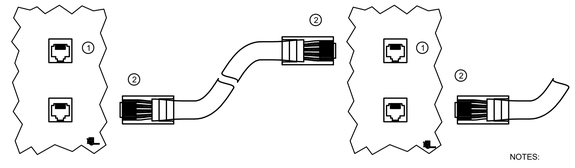


TERMINATION & TESTING OF CAT5 CABLES MUST BE DONE BY A QUALIFIED NETWORK INSTALLER

CABLE TERMINATION REQUIREMENTS :

1. STRIP OFF OUTER JACKET - APPROXIMATELY 1-1/2" (37.6 MM)
2. FIT A PIECE OF 1-1/8" (28.6 MM) LONG HEAT SHRINK TUBE OVER THE CABLE EXTENDING OUT 1/4" (8.25 MM) FROM OUTER JACKET
3. TERMINATE APPROXIMATELY 1/2" (12.2 MM) FROM END OF CONDUCTORS ON TYPE 110 PUNCH DOWN BLOCK OR CONNECTOR PER SCHEDULE (T568B) - MAXIMUM UNTWIST OF CONDUCTORS TO TERMINATIONS IS 1/2" (12.2 MM) - TRIM EXCESS LEADS
4. SHRINK TUBING AND ADD APPROPRIATE ID LABEL TO THE CABLE AT THE END OF THE HEAT SHRINK TUBE

SEE SYSTEM SPECIFIC NOTES ON SHEET LC0.1 FOR MAXIMUM CABLE LENGTHS.



DIGITAL NETWORK CONNECTORS

DIGITAL NETWORK CONNECTORS

(1) RJ45 FEMALE CONNECTOR

(2) RJ45 MALE CONNECTORS. ALL CABLES SUPPLIED BY CONTRACTOR.

NOTES:

DAISY-CHAIN CAT5 PATCH CABLE WITH RJ45 CONNECTORS FROM DIGITAL DEVICE TO DIGITAL DEVICE.

REFER TO MANUFACTURERS INSTRUCTIONS FOR LONG DISTANCE RUNS BETWEEN DIGITAL DEVICES.

CRIMP AND TEST EACH CABLE WITH A LAN CIRCUIT TESTER PRIOR TO INSTALLATION.

CAT5e/6 CABLE TERMINATION

N.T.S.

LIGHTING CONTROL WIRING DIAGRAMS

SCALE N.T.S. | 1

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHEEN HSING FANG
No. E 16592
ELECTRICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 06-24-2024

SHEET TITLE:

ELECTRICAL DETAILS

SCALE: N.T.S. 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and are not to be duplicated without the written consent of Anderson-Brulé Architects. ©

E403

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E403.dwg 7-21-25-12:30 PM

PANEL:	"LLA1"	BRANCH:	NORMAL		
LOCATION:		VOLTAGE:	208/120V	CKT CODE:	1=(CONTINUOUS LOAD)
FED FROM:	MSBD	PHASE & WIRE:	3PH,4W		2=(NON-CONTINUOUS)
MOUNTING:	RECESSED NEMA-1	MIN. BUS:	225 AMPS		3=(RECEPTACLES)
AIC RATING:	42000	MCB:	225 AMPS		4=(KITCHEN)

CIRCUIT		CKT BKR		LOAD TYPE & DESIGNATION				LOAD		PHASES		LOAD TYPE & DESIGNATION					CKT BKR		CIRCUIT	
NO	CODE	TRIP	POLE	DESCRIPTION	MISC	REC	LTG	VA	A	B	C	VA	LTG	REC	MISC	DESCRIPTION	POLE	TRIP	CODE	NO
1	-	20	1	LIGHTING LOWER LEVEL			108	1396	1396	----	----					SPARE	1	20		2
3	1	20	1	LIGHTING LOWER LEVEL			132	1301	----	1301	----					SPARE	1	20		4
5	1	20	1	LIGHTING LOWER LEVEL			47	900	----	----	900					SPARE	1	20		6
7	3	20	1	REC CONFERENCE STORAGE RR		5		900	1620	----	----	720		4		REC CALL RM MEETING RM	1	20	3	8
9	3	20	1	REC CONFERENCE STORAGE RR		5		900	----	1620	----	720		4		REC CALL RM MEETING RM	1	20	3	10
11	3	20	1	REC CONFERENCE STORAGE RR		4		720	----	----	1260	540		3		REC CALL RM MEETING RM	1	20	3	12
13	3	20	1	REC MAKER SPACE		4		720	1620	----	----	900		5		REC PASS OFFICE BOOKSTORE	1	20	3	14
15	3	20	1	REC MAKER SPACE		4		720	----	1440	----	720		4		REC PASS OFFICE BOOKSTORE	1	20	3	16
17	3	20	1	REC MAKER SPACE		4		720	----	----	1440	720		4		REC PASS OFFICE BOOKSTORE	1	20	3	18
19	3	20	1	REC FAB LAB		3		540	1040	----	----	500			1	SLIDING DOOR	1	20	2	20
21	3	20	1	REC FAB LAB		3		540	----	1080	----	540		3		REC LOBBY	1	20	3	22
23	3	20	1	REC FAB LAB		3		540	----	----	900	360		2		REC LOBBY	1	20	3	24
25	3	20	1	VENDING MACHINE		1		500	860	----	----	360		2		REC ELEV RM ELEV PIT	1	20	3	26
27	3	20	1	VENDING MACHINE		1		500	----	750	----	250			1	ELEV CAB LTS	1	20	2	28
29	3	50	2	EXTERIOR PEDESTAL REC		1		2500	----	----	2750	250			1	ELEV CONTROLLER	1	20	2	30
31	3	-	-	-				2500	5000	----	----	2500		1		EXTERIOR PEDESTAL	2	50	3	32
33	3	50	2	EXTERIOR				2500	----	5000	----	2500					-	-	-	34
35	3	-	-	-				2500	----	----	2500					SPARE	1	20		36
37	2	30	2	"EWH-3"	1			2000	2000	----	----					SPARE	1	20		38
39	2	-	-	-				2000	----	2000	----					SPARE	1	20		40
41	2	20	1	"CP-1" & FLUSH VALVES	5			700	----	----	700					SPARE	1	20		42
NOTES:								TOTAL	13536	13191	10450									

CONN.KVA (CODE 1)	3.6
CONN.KVA (CODE 2)	5.7
CONN.KVA (CODE 3)	27.9
CONN.KVA (CODE 4)	0.0
CONNECTED KVA	37.2
CONNECTED AMPS	103.2
FEEDER DEMAND KVA	29.1
FEEDER DEMAND AMPS	80.9

MCB = MAIN CIRCUIT BREAKER MLO = MAIN LUGS ONLY

PANEL:	"1LA1"	BRANCH:	NORMAL		
LOCATION:		VOLTAGE:	208/120V	CKT CODE:	1=(CONTINUOUS LOAD)
FED FROM:	MSBD	PHASE & WIRE:	3PH,4W		2=(NON-CONTINUOUS)
MOUNTING:	RECESSED NEMA-1	MIN. BUS:	225 AMPS		3=(RECEPTACLES)
AIC RATING:	42000	MCB:	225 AMPS		4=(KITCHEN)

CIRCUIT		CKT BKR		LOAD TYPE & DESIGNATION				LOAD		PHASES		LOAD TYPE & DESIGNATION					CKT BKR		CIRCUIT	
NO	CODE	TRIP	POLE	DESCRIPTION	MISC	REC	LTG	VA	A	B	C	VA	LTG	REC	MISC	DESCRIPTION	POLE	TRIP	CODE	NO
1	1	20	1	WORK AREA 315 LTG				1222	1294	----	----	72	4			EXT LOWER LEVEL	1	20	1	2
3	1	20	1	OFFICE/RESTROOM LTG				1089	----	1179	----	90	6			EXT LOBBY ENTRANCE	1	20	1	4
5	1	20	1	CHILDERNS 303 LTG				1368	----	----	1548	180			1	REC BREAKROOM	1	20	3	6
7	1	20	1	ADULTS LTG				1223	2411	----	----	1188			1	GARBAGE DISPOSAL	1	20	3	8
9	1	20	1	ADULTS LTG				1396	----	2596	----	1200			1	DISHWASHER	1	20	3	10
11	1	20	1	ADULTS,OBBY 322 LTG				1283	----	----	1463	180			1	REC BREAKROOM	1	20	3	12
13	1	20	1	COMMUNITY 201 LTG				1352	2852	----	----	1500			1	MICROWAVE BREAKROOM	1	20	3	14
15	1	20	1	TWEENS 302 LTG				1399	----	1579	----	180			1	REC BREAKROOM	1	20	3	16
17	1	20	1	YOUNG ADULTS 307 LTG				893	----	----	2093	1200			1	REFRIGERATOR BREAKROOM	1	20	3	18
19	2	30	2	CU-1/FC-1	2				2180	5360	----	----	3180			EWH-2 BREAKROOM	2	40	2	20
21	-	-	-	-					2180	----	5360	----	3180			-	-	-	2	22
23	2	15	1	EF-1	1				528	----	----	2608	2080			EWH-1 FAMILY RR	2	30	2	24
25	3	20	1	ROOF REC		3			540	2620	----	----	2080			-	-	-	2	26
27	3	20	1	REC MEETING ROOM		3			540	----	2620	----	2080			EWH-1 STAFF RR	2	30	2	28
29	2	20	1	DOOR ACTUATOR	1				250	----	----	2330	2080			-	-	-	2	30
31		20	1	SPARE						0	----	----				SPARE	1	20		32
33		20	1	SPARE						----	0	----				SPARE	1	20		34
35		20	1	SPARE						----	----	0				SPARE	1	20		36
37		20	1	SPARE						0	----	----				SPARE	1	20		38
39		20	1	SPARE						----	0	----				SPARE	1	20		40
41		20	1	SPARE						----	----	500	500		1	LCP-1	1	20		42
NOTES:								TOTAL	14537	13334	10542									

CONN.KVA (CODE 1)	11.4
CONN.KVA (CODE 2)	19.8
CONN.KVA (CODE 3)	6.7
CONN.KVA (CODE 4)	0.0
CONNECTED KVA	38.4
CONNECTED AMPS	106.6
FEEDER DEMAND KVA	40.8
FEEDER DEMAND AMPS	113.1

MCB = MAIN CIRCUIT BREAKER MLO = MAIN LUGS ONLY

PANEL:	"1LA2"	BRANCH:	NORMAL		
LOCATION:		VOLTAGE:	208/120V	CKT CODE:	1=(CONTINUOUS LOAD)
FED FROM:	MSBD	PHASE & WIRE:	3PH,4W		2=(NON-CONTINUOUS)
MOUNTING:	RECESSED NEMA-1	MIN. BUS:	225 AMPS		3=(RECEPTACLES)
AIC RATING:	42000	MCB:	225 AMPS		4=(KITCHEN)

CIRCUIT		CKT BKR		LOAD TYPE & DESIGNATION				LOAD		PHASES		LOAD TYPE & DESIGNATION					CKT BKR		CIRCUIT	
NO	CODE	TRIP	POLE	DESCRIPTION	MISC	REC	LTG	VA	A	B	C	VA	LTG	REC	MISC	DESCRIPTION	POLE	TRIP	CODE	NO
1	3	30	2	REC MDF		1		1500	2400	----	----	900		5		REC OPEN WORK AREA	1	20	3	2
3	3	-	-	-				1500	----	2220	----	720		4		REC OPEN WORK AREA	1	20	3	4
5	3	30	2	REC MDF		1		1500	----	----	2220	720		4		REC OPEN WORK AREA	1	20	3	6
7	3	-	-	-				1500	2400	----	----	900		5		REC MEETING FINANCE IT TECH	1	20	3	8
9	3	20	1	REC MDF		1		500	----	1400	----	900		5		REC MEETING FINANCE IT TECH	1	20	3	10
11	3	20	1	REC MDF		1		500	----	----	1220	720		4		REC MEETING FINANCE IT TECH	1	20	3	12
13	3	20	1	REC DIR OFFICE		4		720	1440	----	----	720		4	1	REC RESTTOOMS BREAKROOM	1	20	3	14
15	3	20	1	REC DIR OFFICE		4		720	----	1440	----	720		4	1	REC RESTTOOMS BREAKROOM	1	20	3	16
17	3	20	1	REC DIR OFFICE		3		540	----	----	900	360		2		REC FLEX RACEWAY	1	20	3	18
19	3	20	1	REC MEETING ROOM RESTROOM		4		720	1080	----	----	360		2		REC FLEX RACEWAY	1	20	3	20
21	3	20	1	REC MEETING ROOM RESTROOM		3		540	----	540	----					SPARE	1	20		22
23	3	20	1	REC MEETING ROOM RESTROOM		3		540	----	----	540					SPARE	1	20		24
25		20	1	SPARE					0	----	----					SPARE	1	20		26
27		20	1	SPARE					----	0	----					SPARE	1	20		28
29		20	1	SPARE					----	----	0					SPARE	1	20		30
31		20	1	SPARE					0	----	----					SPARE	1	20		32
33		20	1	SPARE					----	0	----					SPARE	1	20		34
35		20	1	SPARE					----	----	0					SPARE	1	20		36
37		20	1	SPARE					0	----	----					SPARE	1	20		38
39		20	1	SPARE					----	0	----					SPARE	1	20		40
41		20	1	SPARE					----	----	0					SPARE	1	20		42
NOTES:								TOTAL	7320	5600	4880									

CONN.KVA (CODE 1)	0.0
CONN.KVA (CODE 2)	0.0
CONN.KVA (CODE 3)	17.8
CONN.KVA (CODE 4)	0.0
CONNECTED KVA	17.8
CONNECTED AMPS	49.4
FEEDER DEMAND KVA	13.9
FEEDER DEMAND AMPS	38.6

MCB = MAIN CIRCUIT BREAKER MLO = MAIN LUGS ONLY

PANEL:	"1LA3"	BRANCH:	NORMAL		
LOCATION:		VOLTAGE:	208/120V	CKT CODE:	1=(CONTINUOUS LOAD)
FED FROM:	MSBD	PHASE & WIRE:	3PH,4W		2=(NON-CONTINUOUS)
MOUNTING:	RECESSED NEMA-1	MIN. BUS:	225 AMPS		3=(RECEPTACLES)
AIC RATING:	42000	MCB:	225 AMPS		4=(KITCHEN)

CIRCUIT		CKT BKR		LOAD TYPE & DESIGNATION				LOAD		PHASES		LOAD TYPE & DESIGNATION					CKT BKR		CIRCUIT	
NO	CODE	TRIP	POLE	DESCRIPTION	MISC	REC	LTG	VA	A	B	C	VA	LTG	REC	MISC	DESCRIPTION	POLE	TRIP	CODE	NO
1	3	20	1	REFRIDGERATOR KITCHEN		1		1200	1740	----	----	540		3		REC MEETING GAMING YOUNG AD	1	20	3	2
3	3	20	1	REC KITCHEN		1		180	----	720	----	540		3		REC MEETING GAMING YOUNG AD	1	20	3	4
5	3	20	1	REC KITCHEN		1		180	----	----	720	540		3		REC MEETING GAMING YOUNG AD	1	20	3	6
7	2	40	2	EWH-2	1			3180	4080	----	----	900		5		REC COMMUNITY RM	1	20	3	8
9	2	-	-	-				3180	----	4080	----	900		5		REC COMMUNITY RM	1	20	3	10
11	3	20	1	REC CHARGING STATION		2		360	----	----	1080	720		4		REC COMMUNITY RM	1	20	3	12
13	3	20	1	REC MONITOR		2		360	860	----	----	500			1	SLIDING DOOR	1	20	2	14
15	3	20	1	REC CHILDRENS		2		360	----	720	----	360		2		REC TWEENS	1	20	3	16
17	3	20	1	REC CHILDRENS		3		540	----	----	720	180		1		REC TWEENS	1	20	3	18
19	3	20	1	REC CHILDRENS		2		360	1080	----	----	720		4		REC SERVICE DESK	1	20	3	20
21	3	20	1	REC CHILDRENS		3		540	----	1260	----	720		4		REC SERVICE DESK	1	20	3	22
23		20	1	DOOR ACTUATOR	1			250	----	----	250					SPARE	1	20		24
25		20	1	DOOR ACTUATOR	1			250	250	----	----					SPARE	1	20		26
27				SPACE						----	0					SPARE	1	20		28
29				SPACE						----	----	0				SPARE	1	20		30
31				SPACE						2180	----	----	2180		2	"CU-2"/"FC-2"	2	30	2	32
33				SPACE						----	2180	----	2180			-	-	-	2	34
35				SPACE						----	----	360	360		2	ROOF REC	1	20	3	36
37	2	20	1	SECURITY PANEL				250	7470	----	----	7220			1	"AC-1"/"PE-1"	3	90	2	38
39	2	20	1	ACCESS CONTROL PANEL				250	----	7470	----	7220				-	-	-	2	40
41	2	20	1	FACP				250	----	----	7470	7220				-	-	-	2	42
NOTES:								TOTAL	17660	16430	10600									

CONN.KVA (CODE 1)	0.0
CONN.KVA (CODE 2)	33.6
CONN.KVA (CODE 3)	10.6
CONN.KVA (CODE 4)	0.0
CONNECTED KVA	44.7
CONNECTED AMPS	124.0
FEEDER DEMAND KVA	43.9
FEEDER DEMAND AMPS	121.9

MCB = MAIN CIRCUIT BREAKER MLO = MAIN LUGS ONLY

PANEL SCHEDULE NOTES: (WHERE NOTED)

1. CIRCUITS WITH "◯" ADJACENT SHALL BE GROUND FAULT CIRCUIT INTERRUPTER TYPE.
2. CIRCUITS WITH "L" ADJACENT SHALL BE LOCKED "ON" WITH APPROVED LOCKING DEVICE.
3. CIRCUITS WITH "✳" ADJACENT SHALL BE MARKED RED AND LABELED AS "FIRE ALARM CONTROL CIRCUIT".
4. CIRCUITS WITH "S" ADJACENT SHALL BE SHUNT TRIP CONTROLLED CIRCUIT BREAKERS. CONTROLS AS INDICATED ON DRAWINGS.
5. CIRCUITS WITH "△" ADJACENT SHALL BE CONTROLLED BY PHOTOCELL AND TIMECLOCK. FURNISH AND INSTALL CONTACTORS ABOVE PANEL IN SEPARATE ENCLOSURE.
6. CIRCUITS WITH "△" ADJACENT SHALL BE EMS CONTROLLED.

"LLA1"	"1LA1"
"1LA2"	"1LA3"

DCCR ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.390.0577
Fax 909.980.7023

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHIEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

PANEL SCHEDULES

SCALE: NTS 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E501

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E501.dwg 7-21-25-12:30 PM

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-ELC-E

This document is used to demonstrate compliance with mandatory requirements in 130.5, for electrical systems in newly constructed nonresidential and hotel/motel occupancies and 160.6 and 160.9 for electrical systems in newly constructed multifamily occupancies. Additions and alterations to electrical service systems in nonresidential and hotel/motel occupancies will also use this document to demonstrate compliance per 141.0(a) or 141.0(b)2F for alterations. For multifamily addition or alterations compliance will be documented per 180.1(a) or 180.2 (b)4Bvii

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 1 of 4)**
Project Address:	600 E Mariposa St	**Date Prepared:**	3/5/2025

A. GENERAL INFORMATION

01	Project Location (city)	Altadena	02	Climate Zone	9
			03	Occupancy Types Within Project:	All Other Occupancies:ClassroomLibraryOfficeRetailSupport Areas

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Scope of Work[1]	Rating[2] (kVA)	Utility Provided Metering System Exception to 130.5(a)/ 160.6(a)[3]	System subject to CA Elec Code Article 517 Exception to 130.5(a)and (b)	Demand Response Controls	Provides power to dwelling units/common living areas only in multifamily occupancy
MSBD	Add/Alt to feeders and branch circuits only	432	☒	☐	Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections 120.2/ 160.3, 130.1/ 160.5, and 130.3/ 160.5, and mechanical, indoor lighting, and sign lighting Certificate of Compliance documents will indicate when demand response controls are required.	☐

[1] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c)/160.6(c), no other requirements from 130.5/160.6 are required.
[2] If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.
[3] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-ELC-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 2 of 4)**
		Date Prepared:	3/5/2025

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through J. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05	06
Service Electrical Metering 130.5(a)/ 160.6(a) (See Table F)	AND	Separation for Monitoring 130.5(b)/ 160.6(b) (See Table G)	AND	Voltage Drop 130.5(c)/ 160.6(c) (See Table H)	AND	Controlled Receptacles 130.5(d)/ 160.6(d) (See Table I)	Electric Ready 160.9 (See Table J)	**Compliance Results**
Yes	AND	Yes	AND	Yes	AND	Yes		COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This section does not apply to this project.

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with 130.5(c)/ 160.6(c). For alterations, only the altered circuits must demonstrate compliance per 141.0(b)2Pii/ 180.2(b)4Bviic.

01	02			03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method			Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
						Pass	Fail
MSBD	☒	Voltage drop less than 5%	☐	Permitted by CA Elec Code (Exception to 130.5(c))*	In construction documents	E005	☐	☐

** NOTES: If "Permitted by CA Elec Code "" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-ELC-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 3 of 4)**
		Date Prepared:	3/5/2025

H. VOLTAGE DROP

[1] FOOTNCTES: Voltage drop calculations may be attached to the permit application outside the consruction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

I. CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES

This section does not apply to this project.

J. ELECTRIC READY BUILDINGS

This section does not apply to this project.

K. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-ELC-E - Must be submitted for all buildings

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-ELC-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 4 of 4)**
Project Address:	600 E Mariposa St	**Date Prepared:**	3/5/2025

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Chris Villalobos	Documentation Author Signature:
Company: DCGA Engineers	Signature Date: 2025-03-05
Address: 4750 E. Ontario Mills Parkway	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Ontario CA 91764	Phone: 909-987-0017

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Chen Hsing Fang	Responsible Designer Signature:
Company: DCGA Engineers	Date Signed: 2025-03-05
Address: 4750 E Ontario Mills Parkway	License: E16592
City/State/Zip: Ontario CA 91764	Phone: 909-987-0017

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTI-E

This document is used to demonstrate compliance with requirements in 110.9, 110.12(c), 130.0, 130.1, 140.6 and 141.0(b)2 for indoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e) and 180.2(b)4 for indoor lighting scopes using the prescriptive path for multifamily occupancies. Multifamily includes dormitory and senior living facilities.

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 1 of 10)**
Project Address:	600 E Mariposa St	**Date Prepared:**	3/5/2025

A. GENERAL INFORMATION

01	Project Location (city)	Altadena	04	Total Conditioned Floor Area (ft²)	21,097
02	Climate Zone	9	05	Total Unconditioned Floor Area (ft²)	201
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	1

● Classroom ● Library ● Office ● Retail ● Support Areas ● All Other Occupancies

B. PROJECT SCOPE

This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.6 / 170.2(e) or 141.0(b)2 / 180.2(b)4 for alterations.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☐ New Lighting System				
☐ New Lighting System - Parking Garage				
☒ Altered Lighting System	Area Category Method	21097	Area Category Method	201
Total Area of Work (ft²)	21097		201	

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTI-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 2 of 10)**
		Date Prepared:	3/5/2025

C. COMPLIANCE RESULTS

If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per 140.6(b)1 / 170.2(e)	Allowed Lighting Power per 140.6(a) / 170.2(e) (Watts)						Adjusted Lighting Power per 140.6(a) / 170.2(e) (Watts)						Compliance Results
	01	02	03	04		05	06	07		08		09	
	Complete Building 140.6(c)1	Area Category 140.6(c)2 / 170.2(e)4	Area Category Additional 140.6(c)2G / 170.2(e)4Av (+)	Tailored 140.6(c)3 / 170.2(e)4B (+)	=	**Total Allowed** (Watts)	Total Designed (Watts)	Adjustments PAF Lighting Control Credits 140.6(a)2 / 170.2(e)1B (-)	=	**Total Adjusted** (Watts) *Includes Adjustments			**05 must be >= 08 140.6 / 170.2(e)**
	(See Table I)	(See Table I)	(See Table J)	(See Table K)			(See Table F)	(See Table P)					
Conditioned		18,094.7	0		=	18,095	10,975	0	=	10975	≥		COMPLIES
Unconditioned		80.4	0		=	80	54	0	=	54	≥		COMPLIES
Controls Compliance (See Table H for Details)													COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)													

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTI-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 3 of 10)**
		Date Prepared:	3/5/2025

F. INDOOR LIGHTING FIXTURE SCHEDULE

This table includes all planned permanent and portable lighting other than dwelling unit/ hotel/ motel room lighting. Multifamily dwelling unit and hotel/motel room lighting is documented in Table T. If using Table T to document lighting in multifamily common use areas providing shared provisions for living, eating, cooking or sanitation, those luminaires are not included here.

Designed Wattage: Conditioned Spaces

01	02	03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per 140.6(a)3 / 170.2(e)2C	Design Watts	Field Inspector	
									Pass	Fail
B	Type B - LED Recessed Linear	No	NA	9.5	Mfr. Spec	36	No	342	☐	☐
C	Type C - 2x2 LED Troffer	No	NA	47	Mfr. Spec	32	No	1,504	☐	☐
D	Type D - 4" Squar LED Downlight	No	NA	15	Mfr. Spec	78	No	1,170	☐	☐
E	Type E - Industrial LED Strip	No	NA	18	Mfr. Spec	13	No	234	☐	☐
G	Type G - Sureface LED Sconce	No	NA	22	Mfr. Spec	7	No	154	☐	☐
I	Type I - LED Recessed Linear	No	NA	9.5	Mfr. Spec	748	No	7,106	☐	☐
J	Type J - Pendent LED Globe	No	NA	15	Mfr. Spec	3	No	45	☐	☐
K	Type K - Pendent LED Halo	No	NA	18	Mfr. Spec	3	No	54	☐	☐
L	Type L - Pendent LED Cube Glass	No	NA	51	Mfr. Spec	2	No	102	☐	☐
N	Type N - Pendent LED Small Globe	No	NA	24	Mfr. Spec	11	No	264	☐	☐
						Total Designed Watts: CONDITIONED SPACES		10,975		

Designed Wattage: Unconditioned Spaces

01	02	03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per 140.6(a)3 / 170.2(e)2C	Design Watts	Field Inspector	
									Pass	Fail
E	Type E - Industrial LED Strip	No	NA	18	Mfr. Spec	3	No	54	☐	☐
						Total Designed Watts: UNCONDITIONED SPACES		54		

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTI-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 4 of 10)**
		Date Prepared:	3/5/2025

F. INDOOR LIGHTING FIXTURE SCHEDULE

[1] FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per 140.6(b)4B / 170.2(e)2D is adjusted to be 75% /80% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column D5.
[2] Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b). Wattage used must be the maximum rated for the luminaire, not the lamp.

G. MODULAR LIGHTING SYSTEMS

This section does not apply to this project.

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

This table includes lighting controls for conditioned and unconditioned spaces.

Building Level Controls

01	02	03	
		Field Inspector	
		Pass	Fail
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C		
Required >= 4,000W subject to multilevel	See Area/Space Level Controls	☐	☐

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTI-E

Project Name:	Altadena Libraries Renovation	**Report Page:**	**(Page 5 of 10)**
		Date Prepared:	3/5/2025

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

Area Level Controls

04	05	06	07	08	09	10	11	12	
Area Description	Complete Building or Area Category Primary Function Area	Manual Area Controls 130.1(a) / 160.5(b)4A	Multi-Level Controls 130.1(b) / 160.5(b)4B	Shut-Off Controls 130.1(c) // 160.5(b)4C	Primary/Sky lit Daylighting 130.1(d) / 160.5(b)4D	Secondary Daylighting 130.1(d) / 160.5(b)4D	Interlocked Systems 140.6(a)1/ 170.2(e)2A	Field Inspector	
								Pass	Fail
Office Areas	Office (<=250 square feet)	Readily Accessible	Dimmer	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
Library Stacks Areas	Library - Stacks	Readily Accessible	Dimmer	Occupancy Sensor	Included	Included	No	☐	☐
Workrooms/Classrooms	Classroom, Lecture, or Training Vocational	Readily Accessible	Dimmer	Occupancy Sensor	Included	Included	No	☐	☐
Lobbys	Main Entry Lobby	Readily Accessible	Dimmer	Occupancy Sensor	Included	Included	No	☐	☐
Storage Rooms	All Other Space Types	Readily Accessible	NA: Enclosed area w/ 1 inseparable SSL luminaire	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
Restrooms	Restroom	Readily Accessible	NA: Restrooms	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
Meeting/Conference Rooms	Convention, Conference, Multipurpose and Meeting Center	Readily Accessible	Dimmer	Occupancy Sensor	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
MDF Room	Electrical Mechancial Telephone Room	Readily Accessible	Dimmer	NA: Elec. equip. rm	NA: General Ltg < 120W	NA: General Ltg < 120W	No	☐	☐
							13		
							Plan Sheet Showing Daylit Zones:		
							E202/E203		

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

TITLE 24

SCALE: NTS: 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7323

E601

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E601.dwg 7-21-25-12:30 PM

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 6 of 10)**
	Date Prepared:	3/5/2025

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Each area complying using the Complete Building or Area Category Methods per 140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per 140.6(c) or adjustments per 140.6(e) are being used .

Conditioned Spaces

01	02	03	04	05	06	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowance / Adjustment	
					Area Category	PAF
Room 307	Classroom, Lecture, or Training Vocational	0.6	1,075	645	No	No
Tweens 302	Library - Stacks	1	2,147	2,147	No	No
Service Desk 300	Main Entry Lobby	0.7	744	520.8	No	No
305/306	Convention, Conference, Multipurpose and Meeting Center	0.75	283	212.2	No	No
Childrens 303-2	Library - Stacks	1	1,470	1,470	No	No
313-314	Library - Reading Area	0.8	397	317.6	No	No
310/311/312	Office (>250 square feet)	0.6	360	216	No	No
Open Work Area 315	Library - Stacks	1	1,190	1,190	No	No
317/317-2/318/319	Convention, Conference, Multipurpose and Meeting Center	0.75	519	389.2	No	No
303-1/301	Library - Stacks	1	1,918	1,918	No	No
321-2/320/exterior south west	Library - Stacks	1	720	720	No	No
308	Restroom	0.65	56	36.4	No	No
309	Restroom	0.65	62	40.3	No	No
Interior South	Library - Stacks	1	2,996	2,996	No	No
Exterior South	Library - Stacks	1	1,480	1,480	No	No
103/104/101	Classroom, Lecture, or Training Vocational	0.6	1,155	693	No	No
105/106	Retail Merchandise Sales	0.95	699	664	No	No
Passport Office 107	Office (>250 square feet)	0.6	348	208.8	No	No
110-1/109-1/101/108-1/111-1	Main Entry Lobby	0.7	1,377	963.9	No	No

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 7 of 10)**
	Date Prepared:	3/5/2025

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

111-4	Convention, Conference, Multipurpose and Meeting Center	0.75	234	175.5	No	No
113-2	Restroom	0.65	260	169	No	No
201	Classroom, Lecture, or Training Vocational	0.6	1,307	784.2	No	No
Kitchen 202	Kitchen/ Food Preparation	0.55	119	65.4	No	No
MDF 316A	All Other Space Types	0.4	101	40.4	No	No
Elevator Control Room 102	All Other Space Types	0.4	80	32	No	No
		TOTALS:	21,097	18,094.7	See Tables J, or P for detail	

Unconditioned Spaces

01	02	03	04	05	06	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowance / Adjustment	
					Area Category	PAF
Storage 203	All Other Space Types	0.4	60	24	No	No
Unconditioned	All Other Space Types	0.4	141	56.4	No	No
		TOTALS:	201	80.4	See Tables J, or P for detail	

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

This section does not apply to this project.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE

This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY

This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 8 of 10)**
	Date Prepared:	3/5/2025

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING

This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED DECORATIVE /SPECIAL EFFECTS

This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE

This section does not apply to this project.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))

This section does not apply to this project.

Q. RATED POWER REDUCTION COMPLIANCE FOR ONE-FOR-ONE ALTERATIONS

This section does not apply to this project.

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS

This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)

This section does not apply to this project.

T. DWELLING UNIT LIGHTING

This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 9 of 10)**
	Date Prepared:	3/5/2025

U. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selections have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTI-E - Must be submitted for all buildings

V. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selections have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	Office Areas; Library Stacks Areas; Workrooms/Classrooms; Lobbys; Storage Rooms; Restrooms; Meeting/Conference Rooms;
NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	Library Stacks Areas; Workrooms/Classrooms; Lobbys;
NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.	Whole Building Demand Response;

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 10 of 10)**
Project Address: 600 E Mariposa St	**Date Prepared:**	3/5/2025

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Chris Villalobos	Documentation Author Signature:
Company: DCGA Engineers	Signature Date: 2025-03-05
Address: 4750 E. Ontario Mills Parkway	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Ontario CA 91764	Phone: 909-987-0017

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Chen Hsing Fang	Responsible Designer Signature:
Company: DCGA Engineers	Date Signed: 2025-03-05
Address: 4750 E Ontario Mills Parkway	License: E16592
City/State/Zip: Ontario CA 91764	Phone: 909-987-0017

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
This document is used to demonstrate compliance with requirements in 110.9, 130.0, 130.2, 140.7, and 141.0(b)2L for outdoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e)6, 180.1(a) and 180.2(b)4Biv for outdoor lighting scopes using the prescriptive path for multifamily and mixed-use occupancies. Multifamily includes dormitory and senior living facilities.		
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 1 of 7)**
Project Address: 600 E Mariposa St.	**Date Prepared:**	3/5/2025

A. GENERAL INFORMATION

01	Project Location (city)	Altadena	04	Total Illuminated Hardscape Area (ft²) 2405
02	Climate Zone	9		
03	Outdoor Lighting Zone per Title 24 Part 1 10.114 or as designated by Authority Having Jurisdiction (AHJ):			
☐	LZ-0: Very Low - Undeveloped Parkland	☒ LZ-2: Moderate - Urban Clusters	☐ LZ-4: High - Must be reviewed by CA Energy Commission for Approval	
☐	LZ-1: Low - Rural Areas	☐ LZ-3: Moderately High - Urban Areas		
05	Occupancy Types within Project			

● Classroom ● Library ● Office ● Retail ● Support Areas ● All Other Occupancies

B. PROJECT SCOPE

This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6i or 141.0(b)2L / 180.2(b)4Biv for alterations.

My Project Consists of:

01	02	
☐ New Lighting System	Must Comply with Allowances from 140.7 / 170.2(e)6	
☒ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)?	● Yes ○ No
03	04	05
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method
☐ < 10% ☐ >= 10% and < 50% ☐ >= 50%	0	

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.

[1] FOOTNCTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 2 of 7)**
	Date Prepared:	3/5/2025

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through N. Note: If any cell or this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Biv												Compliance Results	
01		02		03		04		05		06		07	08	09
General Hardscape Allowance 140.7(d)1 / 170.2(e)6i (See Table I)	+	Per Application 140.7(d)2 / 170.2(e)6 (See Table J)	+	Sales Frontage 140.7(d)2 (See Table K)	+	Ornamental 140.7(d)2 / 170.2(e)6 (See Table L)	+	Per Specific Area 140.7(d)2 / 170.2(e)6i (See Table M)	OR	Existing Power Allowance 141.0(b)2L / 180.2(b)4Biv (See Table N)	=	**Total Allowed** (Watts)	≥ **Total Actual** (Watts)	**07 must be >= 08**
342	+	---	+	---	+	---	+	---	OR	---	=	342	≥ 162	COMPLIES
Shielding Compliance (See Table G for Details)														N/A
Controls Compliance (See Table H for Details)														COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 3 of 7)**
	Date Prepared:	3/5/2025

F. OUTDOOR LIGHTING FIXTURE SCHEDULE

For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per 141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included). Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

Designed Wattage:

01	02		03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description		Watts per luminaire[1, 2]	How is Wattage determined	Total Number Luminaires[2]	Luminaire Status[3]	Excluded per 140.7(a) / 170.2(e)6A	Design Watts	Cutoff Req. > 6,200 initial lumen output 130.2(b) / 160.5(c)[4]	Field Inspector	
										Pass	Fail
D	Type D - 4" Squar LED Downlight	☐ Linear	15	Mfr. Spec	6	New	☐	90	NA: < 6200 lumens	☐	☐
K	Type K - Pendent LED Halo	☐ Linear	18	Mfr. Spec	4	New	☐	72	NA: < 6200 lumens	☐	☐
							Total Design Watts:	162			

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to 130.2(b)

[1] FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)
[2] For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.
[3] Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Selrct "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.
[4] Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by 130.2(b)/ 160.5(c)

G. SHIELDING REQUIREMENTS (BUG)

This section does not apply to this project.

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 4 of 7)**
	Date Prepared:	3/5/2025

H. OUTDOOR LIGHTING CONTROLS

This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
Outdoor lighting for nonresidential buildings, parking garages and common service areas in multifamily buildings must be documented separately from outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit

Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings

01	02	03	04	05	
Area Description	Shut-Off 130.2(c)1 / 160.5(c)	Auto-Schedule 130.2(c)2 / 160.5(c)	Motion Sensor 130.2(c)3 / 160.5(c)	Field Inspector	
				Pass	Fail
Exterior Overhang	Astronomical Timer	Provided	NA: Each Luminaire <= 40 Watts	☐	☐
Bridge Walkway	Astronomical Timer	Provided	NA: Each Luminaire <= 40 Watts	☐	☐

[1] FOOTNOTE: Text has been abbreviated, please refer to Table 160.5-A to confirm compliance with the specific light source technologies listed.
[2] Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.
[3] Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are excepted from ii and iii.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER CHEN HSING FANG No. E 16592 ELECTRICAL STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 06-24-2024
SHEET TITLE:

TITLE 24

SCALE: NONE 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, CA 91764
Ph 909.987.0017
Fax 909.980.7023

E602

R:\Altadena Libraries Renovations #21085\Main Branch\CAD Dwgs\E\21085E602.dwg 7-21-25-12:31 PM

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 5 of 7)**
	Date Prepared:	3/5/2025

I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))

This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/Table 170.2-R while "Use it or lose it" Allowances are per Table 140.7-B /Table 170.2-S. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance. Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

	01				
	"Use it or lose it" Allowance (select all that apply) (select all that apply)				
	☒ General Hardscape Allowance Table I (below)	☐ Per Application Table J	☐ Sales Frontage Table K	☐ Ornamental Table L	☐ Per Specific Area Table M

Calculated General Hardscape Lighting Power Allowance per Table 140.7-A for Nonresidential & Hotel/Motel

02	03	04	05	06	07	08	09
Area Description	Area Wattage Allowance (AWA)			Linear Wattage Allowance (LWA)			Total General AWA + LWA (Watts)
	Illuminated Area (ft^2)	Allowed Density (W/ft^2)	Area Allowance (Watts)	Perimeter Length (lf)	Allowed Density (W/lf)	Linear Allowance (Watts)	
Main Lobby Entrance	930	0.019	17.7	143	0.2	21.4	39
Lower Level Entrence	1475	0.019	28	502	0.2	75.3	103
					Initial Wattage Allowance for Entire Site (Watts):		200
					Instances of Initial Wattage Allowance (LZ 0 only)[1]		
					Total General Hardscape Allowance (Watts):		342

J. LIGHTING ALLOWANCE: PER APPLICATION

This section does not apply to this project.

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL

This section does not apply to this project.

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 6 of 7)**
	Date Prepared:	3/5/2025

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This section does not apply to this project.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTO-E - Must be submitted for all buildings

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	Exterior Overhang; Bridge Walkway;

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: Altadena Libraries Renovation	**Report Page:**	**(Page 7 of 7)**
Project Address: 600 E Mariposa St.	**Date Prepared:**	3/5/2025

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Chris Villalobos	Documentation Author Signature:
Company: DCGA Engineers	Signature Date: 2025-03-05
Address: 4750 E. Ontario Mills Parkway	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Ontario CA 91764	Phone: 909-987-0017

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Chen Hsing Fang	Responsible Designer Signature:
Company: DCGA Engineers	Date Signed: 2025-03-05
Address: 4750 E Ontario Mills Parkway	License: E16592
City/State/Zip: Ontario CA 91764	Phone: 909-987-0017

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

BUILDING PERMIT SUBMITTAL

CONSULTANTS LOGO

REGISTERED PROFESSIONAL ENGINEER
CHEN HSING FANG
No. E 16592
ELECTRICAL
STATE OF CALIFORNIA

STAMP

NO.	DATE	REVISIONS
	06/24/2024	BUILDING PERMIT SUBMITTAL
1	03/07/2025	BACKCHECK #1 MEP BLDG PERMIT SUBMITTAL
3	06/10/25	BACKCHECK #2 MECH & PLUMB BLDG PERMIT SUBMITTAL
4	07/18/25	BACKCHECK #3 PLUMB BLDG PERMIT SUBMITTAL
5	07/21/25	BACKCHECK #3 ELECTRICAL BLDG PERMIT SUBMITTAL

PROJECT TITLE:

Altadena Main Library

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	06-24-2024

SHEET TITLE:

TITLE 24

SCALE: NTS 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

E603

DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph 909.987.0017
Fax 909.980.7323

AV SYSTEMS SHEET SET	
Sheet Number	Sheet Name
00 - LEGEND	
AV000	LEGEND
10-PLANS	
AV101	LOWER LEVEL - AV PLAN
AV102	MAIN LEVEL - AV PLAN
AV102A	MAIN LEVEL ALT - AV PLAN
20 - ENLARGEMENTS	
AV101P	LOWER LEVEL - AV PAGING PLAN
20-ENLARGED	
AV102P	MAIN LEVEL - AV PAGING PLAN
AV201	TELE MEETING ROOM ENLARGED PLANS
AV202	STAFF MEETING ROOM ENLARGED PLANS
AV203	DIGITAL SIGNAGE ENLARGED PLANS
AV204	GAMING ROOM ENLARGED PLANS
AV205	COMMUNITY ROOM ENLARGED PLANS
AV206	OPEN WORK AREA ENLARGED PLANS
AV207	DIGITAL SIGNAGE 2 ENLARGED PLANS
AV209	DIGITAL SIGNAGE 3 IN KIOSK ENLARGED PLANS
30-SECTIONS AND ELEVATIONS	
AV301	TELE MEETING ROOM SECTIONS AND ELEVATIONS
AV302	STAFF MEETING ROOM SECTIONS AND ELEVATIONS
AV303	DIGITAL SIGNAGE SECTIONS AND ELEVATIONS
AV304	GAMING ROOM SECTIONS AND ELEVATIONS
AV305	COMMUNITY ROOM SECTIONS AND ELEVATIONS
AV306	OPEN WORK AREA SECTIONS AND ELEVATIONS
AV307	DIGITAL SIGNAGE 2 SECTIONS AND ELEVATIONS
AV309	DIGITAL SIGNAGE 3 IN KIOSK SECTIONS AND ELEVATIONS
40-SCHEMATIC	
AV401	TELE MEETING ROOM LINE DIAGRAM
AV402	STAFF MEETING ROOM LINE DIAGRAM
AV403	DIGITAL SIGNAGE LINE DIAGRAM
AV404	GAMING ROOM LINE DIAGRAM
AV405	COMMUNITY ROOM LINE DIAGRAM
AV405.2	COMMUNITY ROOM LINE DIAGRAM
AV406	OPEN WORK AREA LINE DIAGRAM
AV407	DIGITAL SIGNAGE 2 LINE DIAGRAM
AV408	PAGING LINE DIAGRAM
AV409	DIGITAL SIGNAGE 3 IN KIOSK LINE DIAGRAM
50 - RACK ELEVATIONS	
AV501	RACK ELEVATIONS
60 - CUSTOM PLATES	
AV601	CUSTOM PLATES

EXAMPLE SHEET SET		
Sheet Number	Sheet Name	
0 - LEGEND		
000	LEGEND	0
1 - KEY PLANS		
101	KEY PLANS - LEVEL 01	1
102	KEY PLANS - LEVEL 02	
2 - ENLARGEMENTS		
201	ENLARGED PLANS - SYSTEM 01	2
202	ENLARGED PLANS - SYSTEM 02	
3 - ELEVATIONS AND SECTIONS		
301	ELEVATIONS AND SECTIONS - SYSTEM 01	3
302	ELEVATIONS AND SECTIONS - SYSTEM 02	
4 - LINE DIAGRAMS		
401	LINE DIAGRAMS - SYSTEM 01	4
402	LINE DIAGRAMS - SYSTEM 02	
5 - RACK ELEVATIONS		
501	RACK ELEVATIONS	5
6 - CUSTOM PLATES		
601	CUSTOM PLATES	6

SHEET LIST NAVIGATION	
ID	DESCRIPTION
0	SHEET LIST AND DRAWING SYMBOL LEGENDS
1	OVERALL KEY PLANS INDICATING SYSTEM LOCATIONS - SHEET NUMBER CORRESPONDS WITH LEVEL
2	ENLARGED PLANS PER SYSTEM - SHEET NUMBER CORRESPONDS TO SYSTEM ID
3	ELEVATIONS AND SECTIONS PER SYSTEM - SHEET NUMBER CORRESPONDS TO SYSTEM ID
4	LINE DIAGRAMS PER SYSTEM - SHEET NUMBER CORRESPONDS TO SYSTEM ID (AV ONLY)
5	AV EQUIPMENT RACK ELEVATIONS (AV ONLY)
6	CUSTOM PLATES AND METAL WORK (AV ONLY)



REPRESENTS THE EQUIPMENT TYPE ID. ALL EQUIPMENT OF THE SAME MAKE, MODEL, MOUNTING METHOD AND INSTALLATION SPECIFICATION BELONG TO A SINGLE EQUIPMENT TYPE ID.

(#) REPRESENTS THE EQUIPMENT INSTANCE ID. EACH INSTANCE OF EQUIPMENT WILL HAVE A UNIQUE EQUIPMENT INSTANCE ID PER SYSTEM.

AV NOTES	
[1]	INSTALL WALL MOUNTED TOUCHPANELS ACCORDING TO APPLICABLE ACCESSIBILITY GUIDELINES.
[2]	CAMERA LENS ELEVATION IS SHOWN AS REQUIRED. MODIFICATIONS OR SUBSTITUTIONS SHOULD MAINTAIN LENS LOCATION. SCHEDULED DIMENSIONS FOR CAMERAS ARE TO CENTER OF LENS.
[3]	PROJECTOR LENS ELEVATION IS SHOWN AS REQUIRED. MODIFICATIONS OR SUBSTITUTIONS SHOULD MAINTAIN LENS LOCATION. SCHEDULED DIMENSIONS FOR CAMERAS ARE TO CENTER OF LENS.
[4]	DISPLAY MOUNT ELEVATION IS MEASURED TO CENTER OF BRACKET.

AV EQUIPMENT ADDITIONAL INFORMATION	
ID	DESCRIPTION
1	ADJUSTABLE DISPLAY MOUNT
2	8-BUTTON CONTROL KEYPAD
3	32" DIGITAL SIGNAGE DISPLAY
5	33" MULTIMEDIA LECTERN
8	EXPANSION MICROPHONE
10	AV CONNECTION PLATE
11	PROJECTOR
12	TABLE MOUNTED CABLE ACCESS ENCLOSURE
13	6.5" CEILING SPEAKER
14	55" DISPLAY
15	OWNER FURNISHED MONITOR
16	CONFERENCE CONTROL TOUCH INTERFACE
18	12X PTZ CAMERA
20	PTZ CAMERA CONTROLLER
36	PROJECTION SCREEN
50	65" DISPLAY
52	86" DISPLAY
53	98" DISPLAY
55	45 SPACE (78-3/4"), 32" DEEP, MULTIBAY BGR RACK WITH REAR DOOR, BLACK FINISH
56	44RU EQUIPMENT RACK
57	CONFERENCE CAMERA/MIC/SPEAKER
59	PULL-OUT DISPLAY MOUNT FOR RPWM-32B-BOX
75	WIRELESS CONFERENCING ACCESS POINT
78	55" DISPLAY
83	55" DISPLAY
88	7" TABLE TOP CONTROL PANEL
89	10" TABLE TOP CONTROL PANEL
90	WIRELESS GOOSENECK BASE
91	10" GOOSENECK MIC
96	10" USER CONTROL PANEL
98	AV CONNECTION PLATE
99	ALS ANTENNA
102	50" INTERACTIVE DISPLAY
111	LARGE TILT MICRO-ADJUSTABLE WALL DISPLAY MOUNT
112	MEDIUM TILT MICRO-ADJUSTABLE WALL DISPLAY MOUNT
114	MEDIUM TILT MICRO-ADJUSTABLE WALL DISPLAY MOUNT
117	WALL DISPLAY MOUNT
126	WALL MOUNTED KEYPAD
128	CONFERENCE CAMERA
129	CEILING SPEAKER
130	CEILING SPEAKER
131	4" PENDANT SPEAKER



THIS SYMBOL DESIGNATES AN AV ENABLED SPACE. THE NUMBER INDICATES THE ASSOCIATED SYSTEM ID. THE ARROW INDICATES ROOM FOCUS OR PRIMARY USER ENGAGEMENT DIRECTION.

AV SYSTEMS LINE DIAGRAM KEY

SYMBOL	DESCRIPTION
FEATHER IN	DESIGNATES A SIGNAL FROM ANOTHER DRAWING (AVXXX) CONNECTED TO [DEVICE NAME] [OUTPUT #]
FEATHER OUT	DESIGNATES A SIGNAL TO ANOTHER DRAWING (AVXXX) CONNECTED TO [DEVICE NAME] [INPUT #]
XXX	DESIGNATES A SIGNAL SHOWN ON THE SAME DRAWING CONNECTED TO SYMBOL WITH MATCHING NUMBER
MAIN SYSTEM	LABEL FOR MAIN SYSTEMS
SUB SYSTEM	LABEL FOR SUB SYSTEMS
XXX	DEVICE NUMBER (QUANTITY IS PER SYSTEM)
	CONTRACTOR TERMINATED CABLING
	PRE-MANUFACTURED CABLE OR NECESSARY ADAPTER CABLE
	OWNER FURNISHED CABLE
	CARD CAGE CONNECTION
	SIGNAL BREAKOUT (EXAMPLE: STEREO AUDIO BREAKOUT TO LEFT AND RIGHT)
	MULTI CABLE DESIGNATION
	WIRE JUNCTION
	LINE TYPE & BOUNDARY DESIGNATE A MAJOR SYSTEM
	LINE TYPE & BOUNDARY DESIGNATE A SUBSYSTEM
PASS THROUGH	ARCHITECTURAL OR FURNITURE PASS-THROUGH NOTE: FURNITURE PASS THROUGHS SHOWN IN THIS WAY ARE SUPPLIED AS PART OF THE CUSTOM MILLWORK UNLESS NOTED OTHERWISE.
CONNECTOR X-PLATE-X (FLOOR PLATE)	TYPICAL AV PLATE DESIGNATION
CONNECTOR X-PLATE-X (FLOOR PLATE)	PARTIAL PLATE: PARTIAL PLATE DRAWING PLATE IS CONTINUED ELSWHERE IN SYSTEM DRAWING
1 IN OUT 1 2 IN OUT 2 (A,AV,C,T,X)-DEVICE-#	TYPICAL DESIGNATION FOR A DEVICE PROVIDED BY AV CONTRACTOR
1 IN OUT 1 2 IN OUT 2 O-DEVICE-#	TYPICAL DESIGNATION FOR A DEVICE THAT IS PROVIDED BY OWNER. (NOTE - NO FILL)

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRES
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025
SHEET TITLE:

LEGEND

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV000

8/14/2025 9:50:23 AM



LOWER LEVEL - AV		
RM#	ROOM	LAYOUT
1 - TELE MEETING ROOM		
111	CONFERENCE ROOM	A
110	MEETING ROOM	A
2		
3 - DIGITAL SIGNAGE		
100	LOWER LEVEL LOBBY	A
1		

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

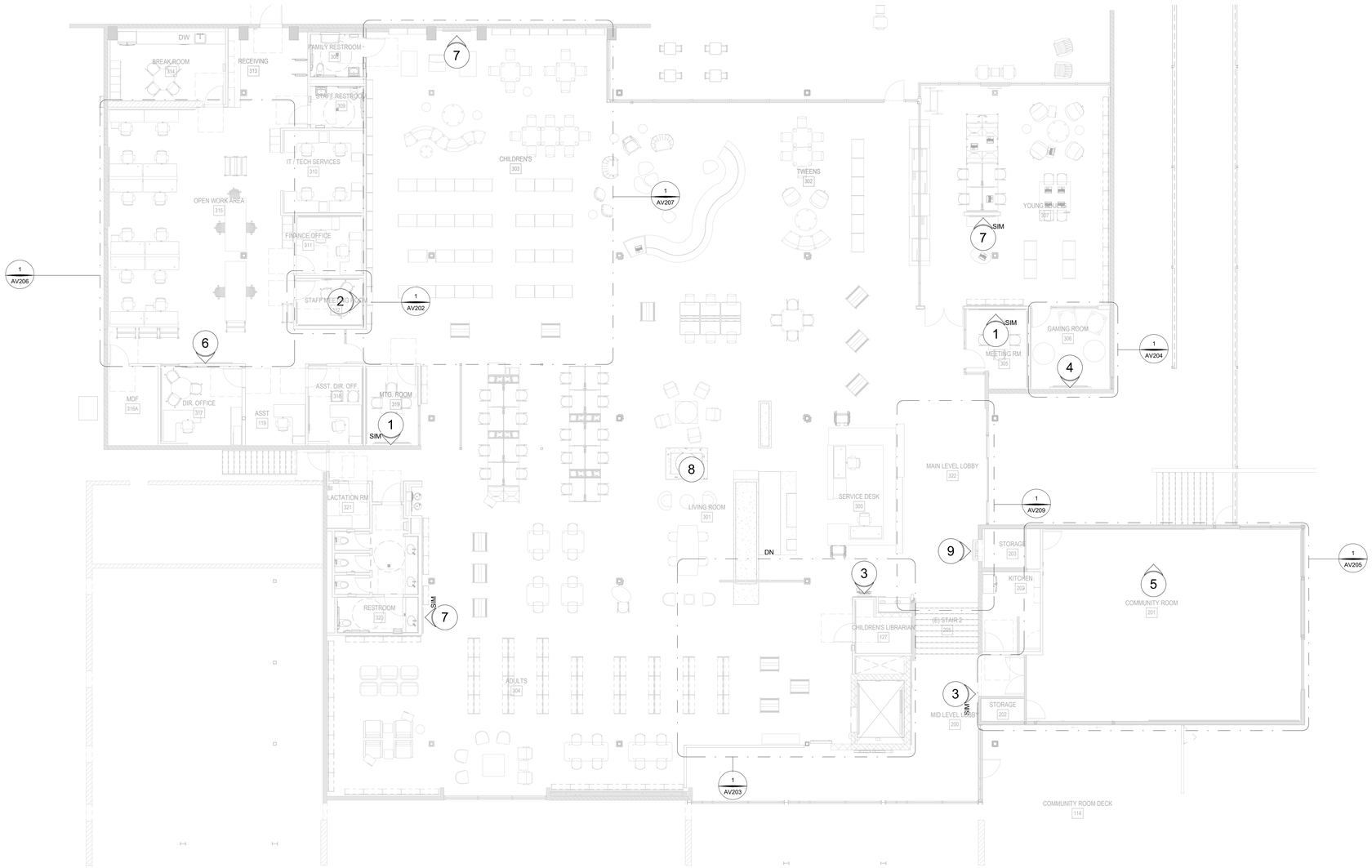
LOWER LEVEL - AV PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV101

8/14/2025 9:50:25 AM



MAIN LEVEL - AV		
RM#	ROOM	LAYOUT
1 - TELE MEETING ROOM		
319	MTG. ROOM	A
1		
2 - STAFF MEETING ROOM		
312	STAFF MEETING ROOM	A
1		
3 - DIGITAL SIGNAGE		
300	SERVICE DESK	A
1		
5 - COMMUNITY ROOM		
201	COMMUNITY ROOM	A
1		
6 - OPEN WORK AREA		
315	OPEN WORK AREA	A
1		
7 - DIGITAL SIGNAGE 2		
303	CHILDREN'S	A
307	YOUNG ADULTS	A
2		
8 - PAGING		
301	LIVING ROOM	A
1		
9 - DIGITAL SIGNAGE 3 IN KIOSK		
322	MAIN LEVEL LOBBY	A
1		

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

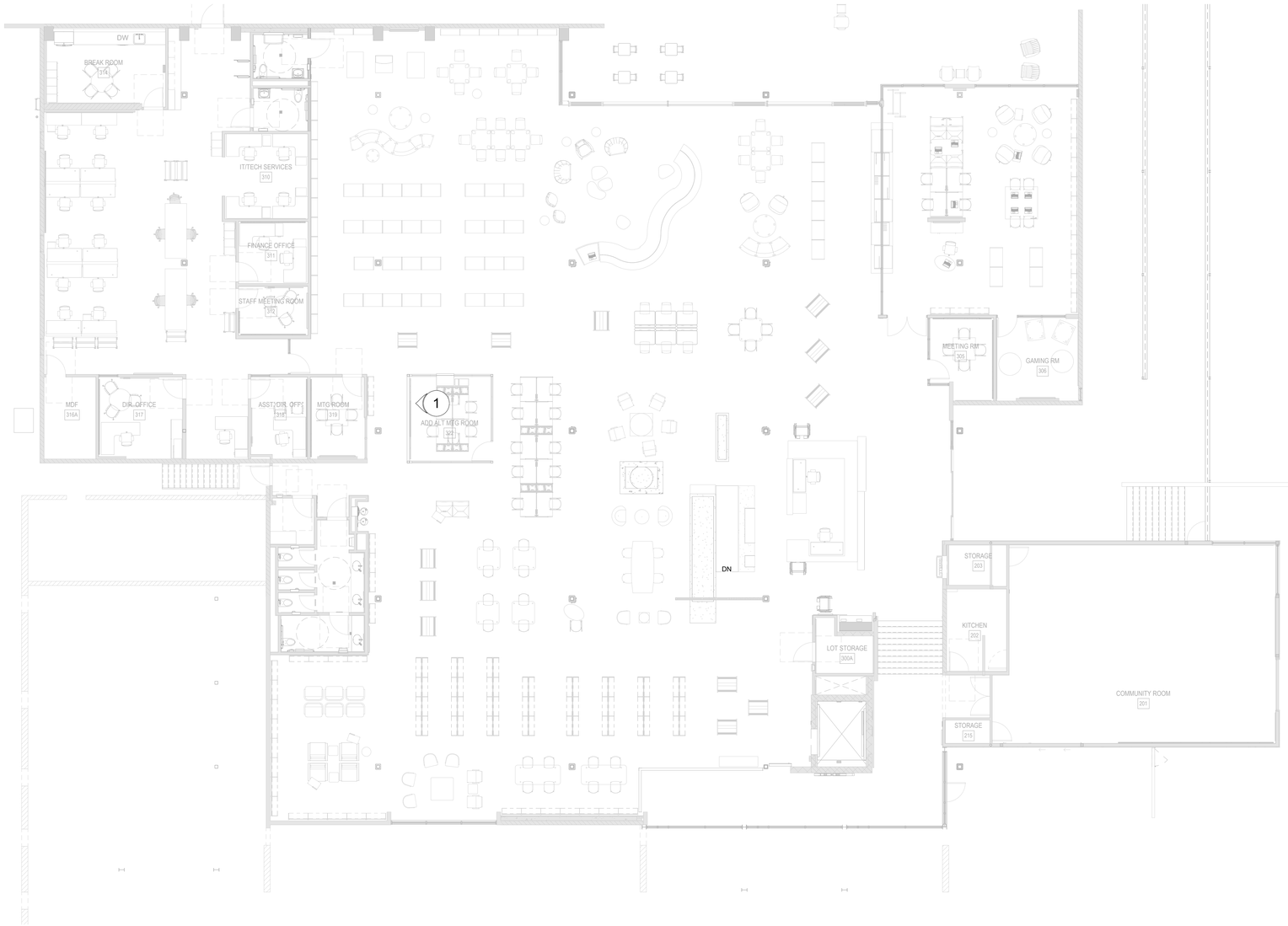
MAIN LEVEL - AV PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV102

8/14/2025 10:26:54 AM



MAIN LEVEL ALT - AV		
RM#	ROOM	LAYOUT
1 - TELE MEETING ROOM		
322	ADD ALT MTG ROOM	A
1		

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

SHEET TITLE:

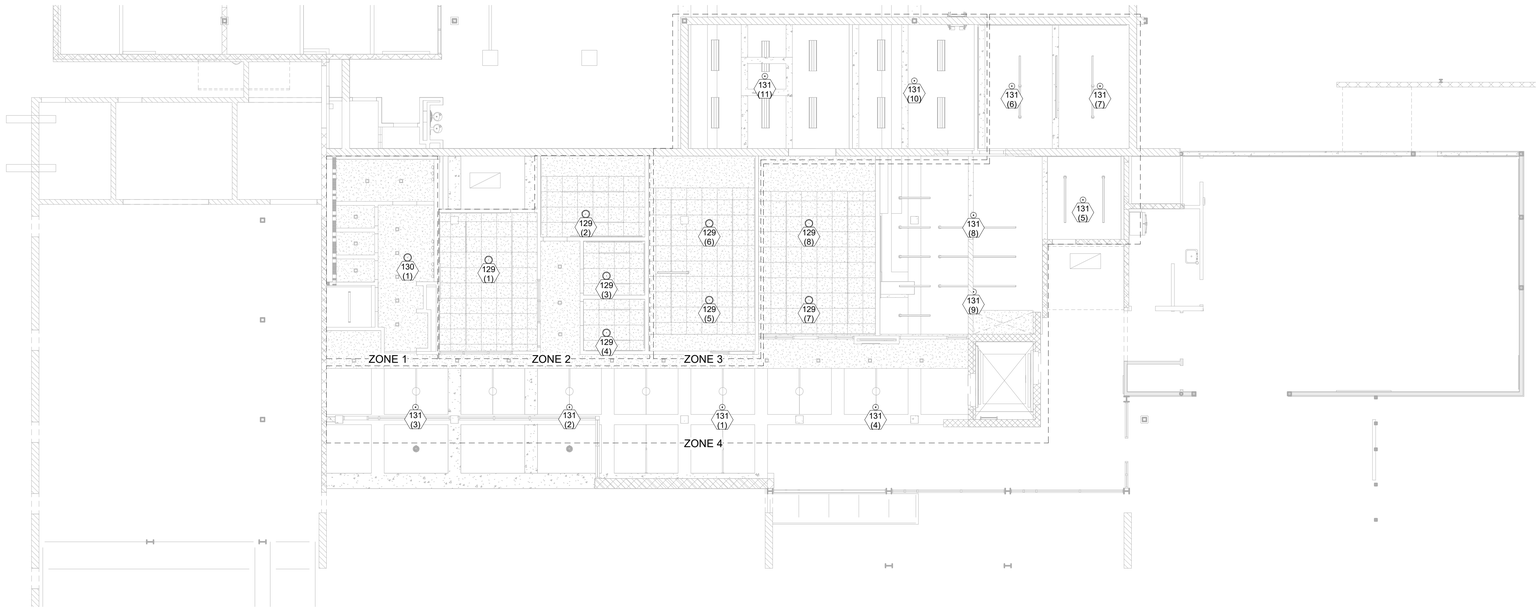
MAIN LEVEL ALT - AV PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV102A

8/14/2025 10:36:56 AM



8 - AV EQUIPMENT			
ID	COUNT	MAKE	MODEL
129	33	ATLAS IED	FAP62T
130	10	ATLAS IED	FA62T-8MB
131	11	ATLAS IED	PM4FA

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 9:50:30 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRATION DATE
2026/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

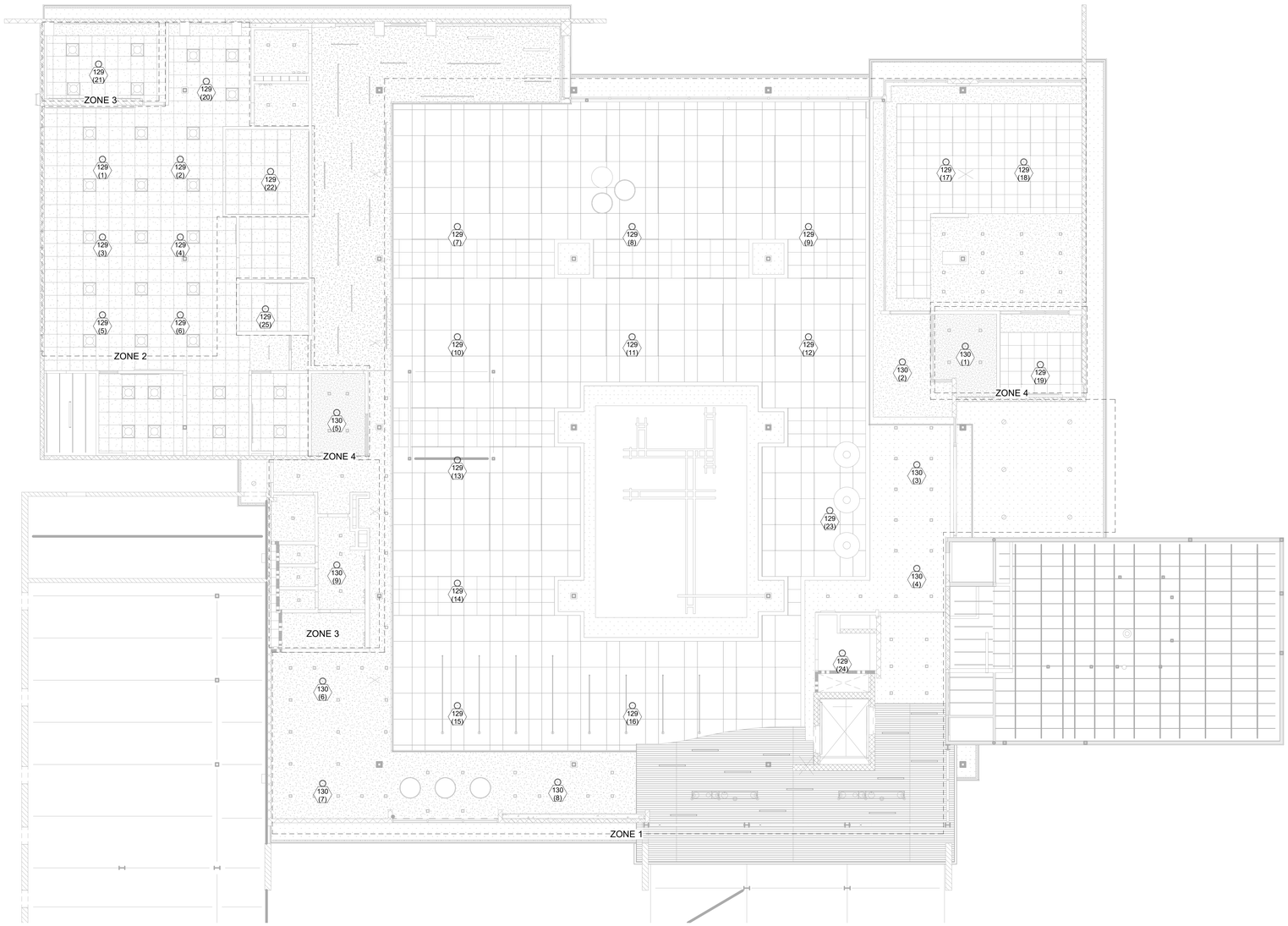
SHEET TITLE:

LOWER LEVEL - AV PAGING PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

AV101P



8 - AV EQUIPMENT			
ID	COUNT	MAKE	MODEL
129	33	ATLAS IED	FAP62T
130	10	ATLAS IED	FA62T-8MB
131	11	ATLAS IED	PM4FA

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design CTS-D Scott Avery 6725494 2028/03/31 Stop

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

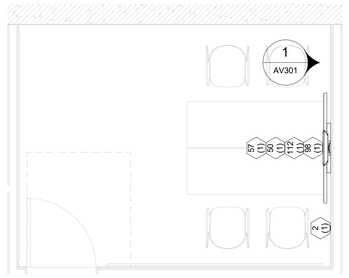
MAIN LEVEL - AV PAGING PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV102P

8/14/2025 9:03:22 AM



1 TELE MEETING ROOM LAYOUT A ENLARGED PLAN
3/8" = 1'-0"

1 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV101
ENLARGED PLAN	1	AV201
ELEVATION	1	AV301

1 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
2	1	45"	CRESTRON	C2N-CBD-E
50	1	36"	LG	65UH5J
57	1	71 1/16"	POLY	R30
98	1	32"	CUSTOM	CUSTOM
112	1	52"	CHIEF	MTM1U

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expiration
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

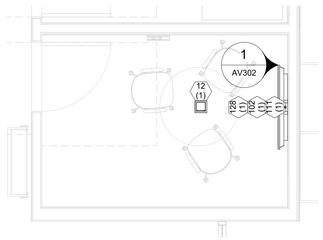
TELE MEETING ROOM ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV201

8/14/2025 9:50:32 AM



1 STAFF MEETING ROOM ENLARGED PLAN
3/8" = 1'-0"

2 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV202
ELEVATION	1	AV302

2 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
12	1	30"	EXTRON	CABLE CUBBY 500 60-1892-02
16	1	29"	POLY	TC8
102	1	30"	MICROSOFT	SURFACE HUB S2 50
111	1	42"	CHIEF	LTM1U
128	1	55 7/32"	MICROSOFT	SURFACE HUB CAMERA

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

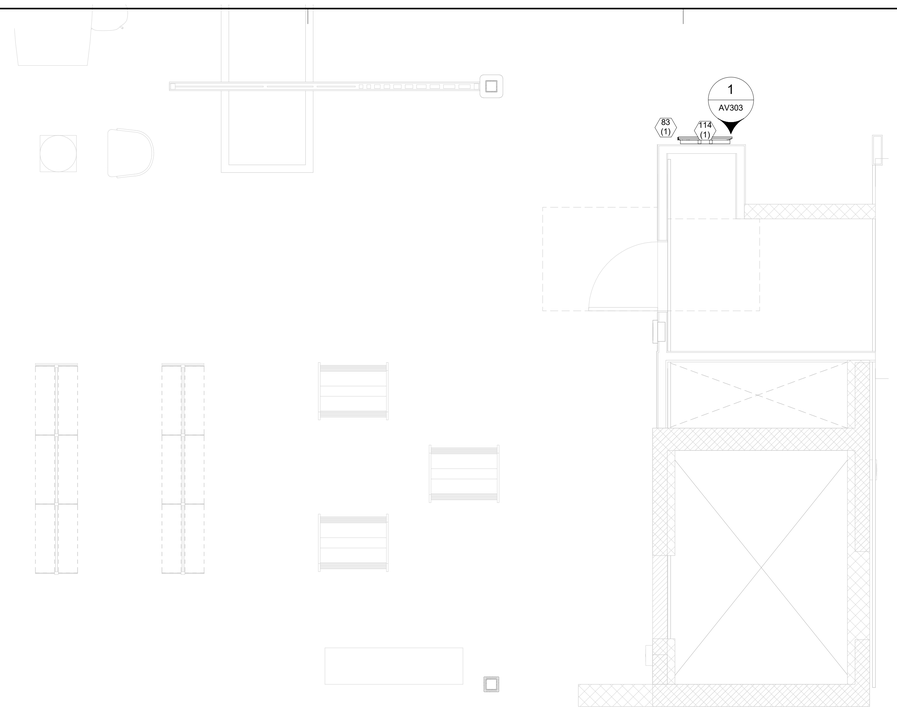
STAFF MEETING ROOM ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV202

8/14/2025 9:50:33 AM



1 DIGITAL SIGNAGE LAYOUT A ENLARGED PLAN
3/8" = 1'-0"

3 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV203
ELEVATION	1	AV303

3 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
83	1	37"	LG	55UH5C
114	1	61 1/4"	CHIEF	MTM1U

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

SHEET TITLE:

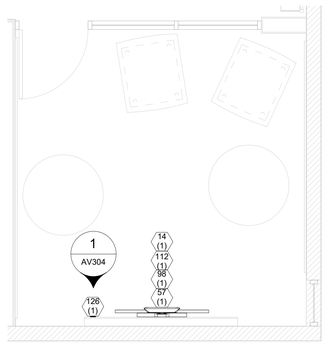
DIGITAL SIGNAGE ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV203

8/14/2025 9:50:33 AM



1 GAMING ROOM
3/8" = 1'-0"

4 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV204
ELEVATION	1	AV304

4 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
14	1	36"	LG	55UH5C
57	1	66"	POLY	R30
98	1	18"	CUSTOM	CUSTOM
112	1	51"	CHIEF	MTM1U
126	1	45"	CRESTRON	C2N-CBD-P

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 9:50:34 AM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

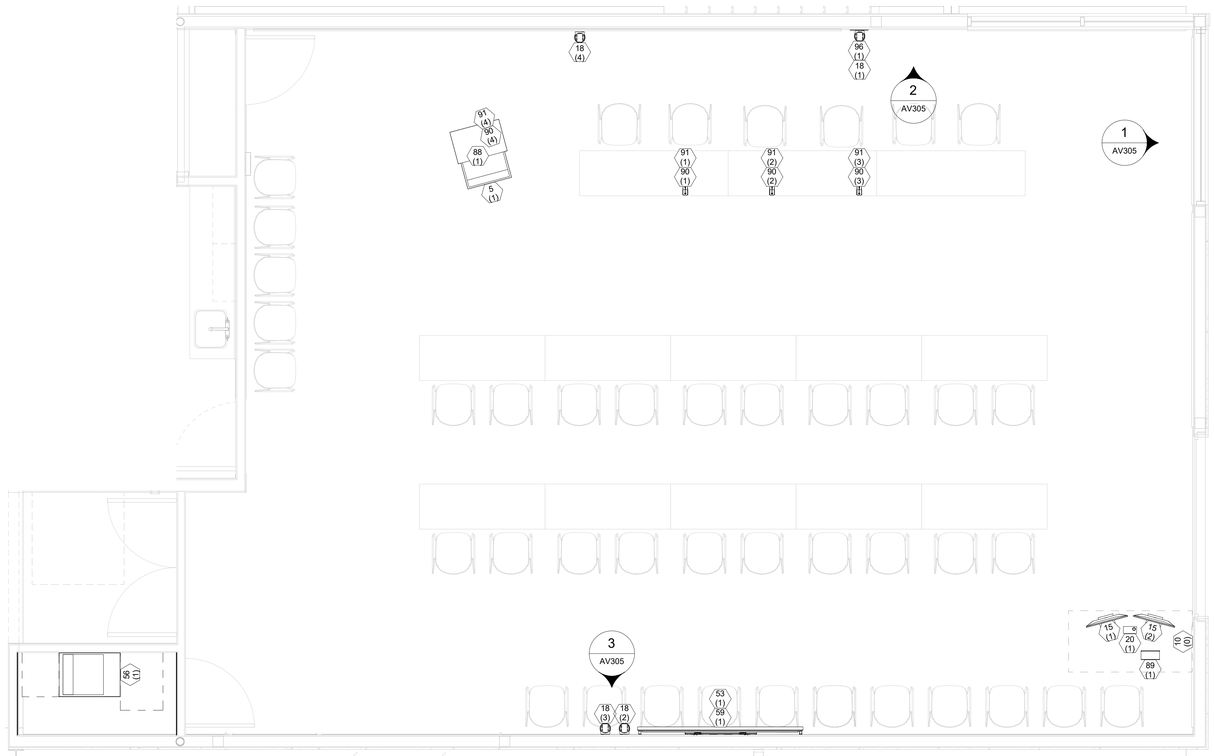
SHEET TITLE:

GAMING ROOM ENLARGED PLANS

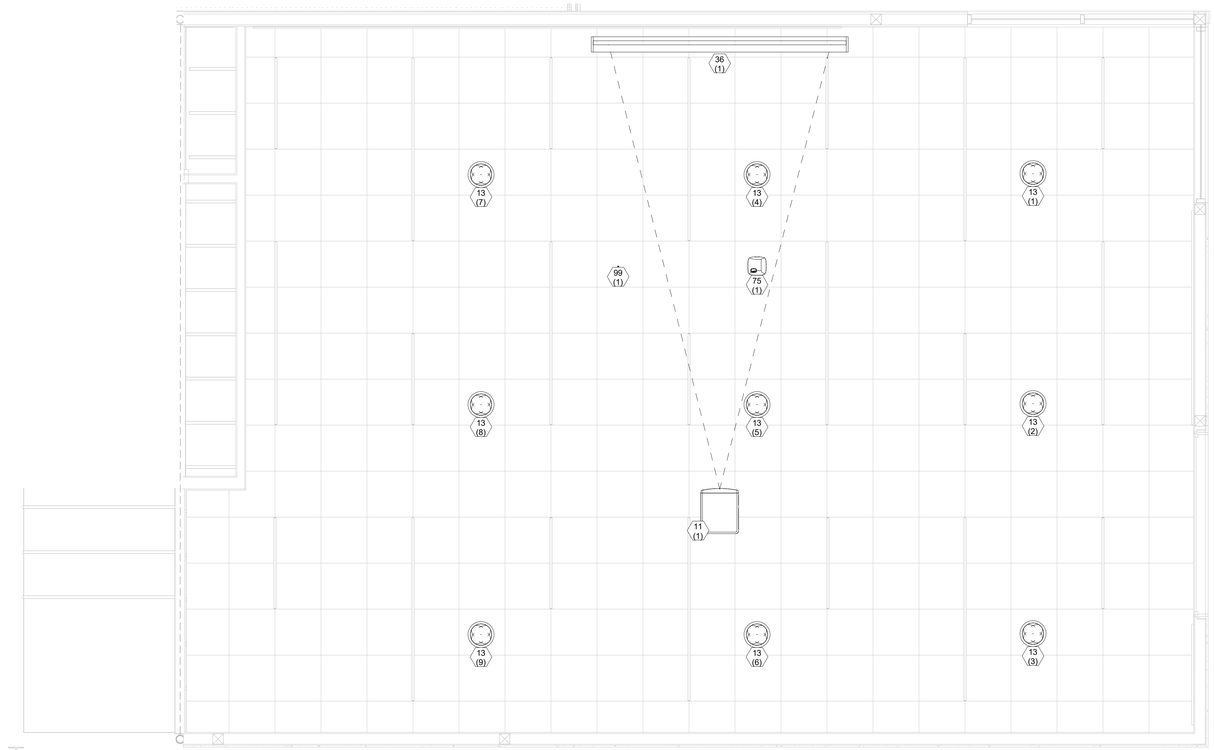
SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV204



1 COMMUNITY ROOM ENLARGED PLAN
3/8" = 1'-0"



2 COMMUNITY ROOM ENLARGED RCP
3/8" = 1'-0"

5 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV205
ENLARGED RCP	2	AV205
ELEVATION	1	AV305
ELEVATION	2	AV305
ELEVATION	3	AV305

5 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
5	1	0"	MIDDLE ATLANTIC PRODUCTS	L5
10	1	18"	CUSTOM	CUSTOM
11	1	120"	DIGITAL PROJECTION	E-VISION LASER 11000 4K-UHD
13	9	127"	JBL	CONTROL 227CT
15	2	30"	OFE	TDB
18	2	85"	QSC	NC-12x80
18	2	90"	QSC	NC-12x80
20	1	30"	SKAARHOJ	PTZ FLY
36	1	129 1/8"	DRAPER	ACCESS E 133" - 139112U
53	1	54"	LG	98UH5J
56	1	0"	MIDDLE ATLANTIC PRODUCTS	WRK-44-32
59	1	79"	RPVISUALS	RPWM-32B-XM-OFFSET-NB
75	1	127"	SHURE	MXWAPT8
88	1	39"	CRESTRON	TS-770
89	1	30"	CRESTRON	TS-1070
90	4	33"	SHURE	MXW8=-Z10
91	4	35"	SHURE	MX410LP/C
96	1	47"	CRESTRON	TSW-1070
99	1	127"	LISTEN TECHNOLOGIES	LA-123

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

SHEET TITLE:

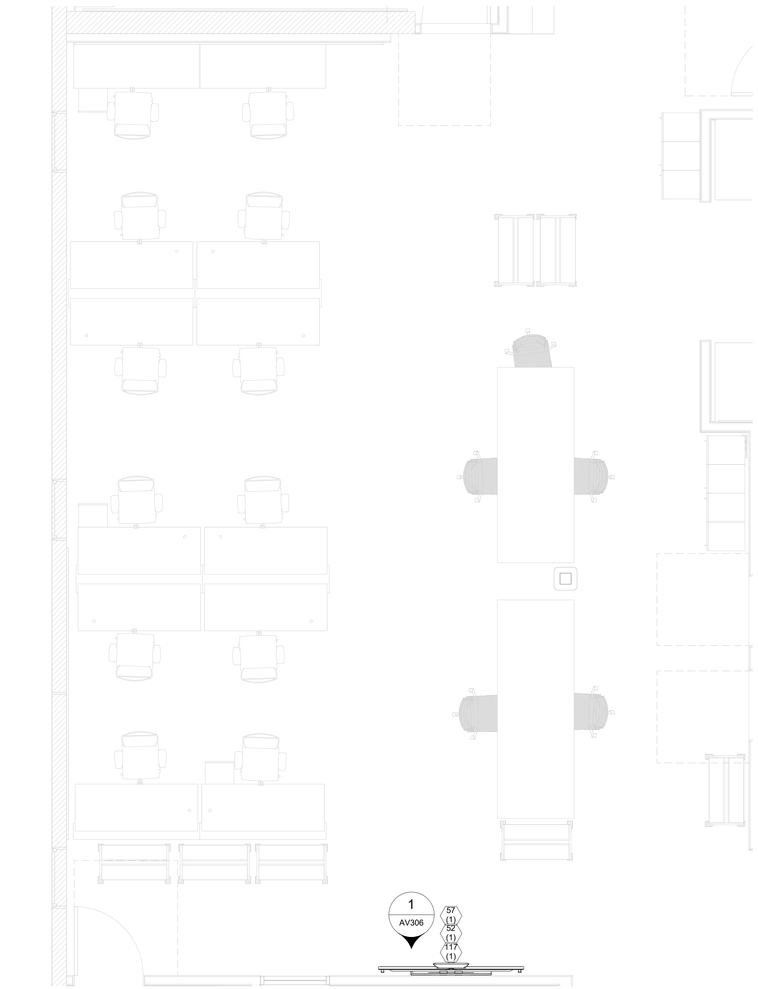
COMMUNITY ROOM ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV205

8/14/2025 9:50:35 AM



1 OPEN WORK AREA ENLARGED PLAN
3/8" = 1'-0"

6 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV206
ELEVATION	1	AV306

6 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
52	1	34"	LG	86UH5J
57	1	79 3/16"	POLY	R30
117	1	56"	CHIEF	AS3LD

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

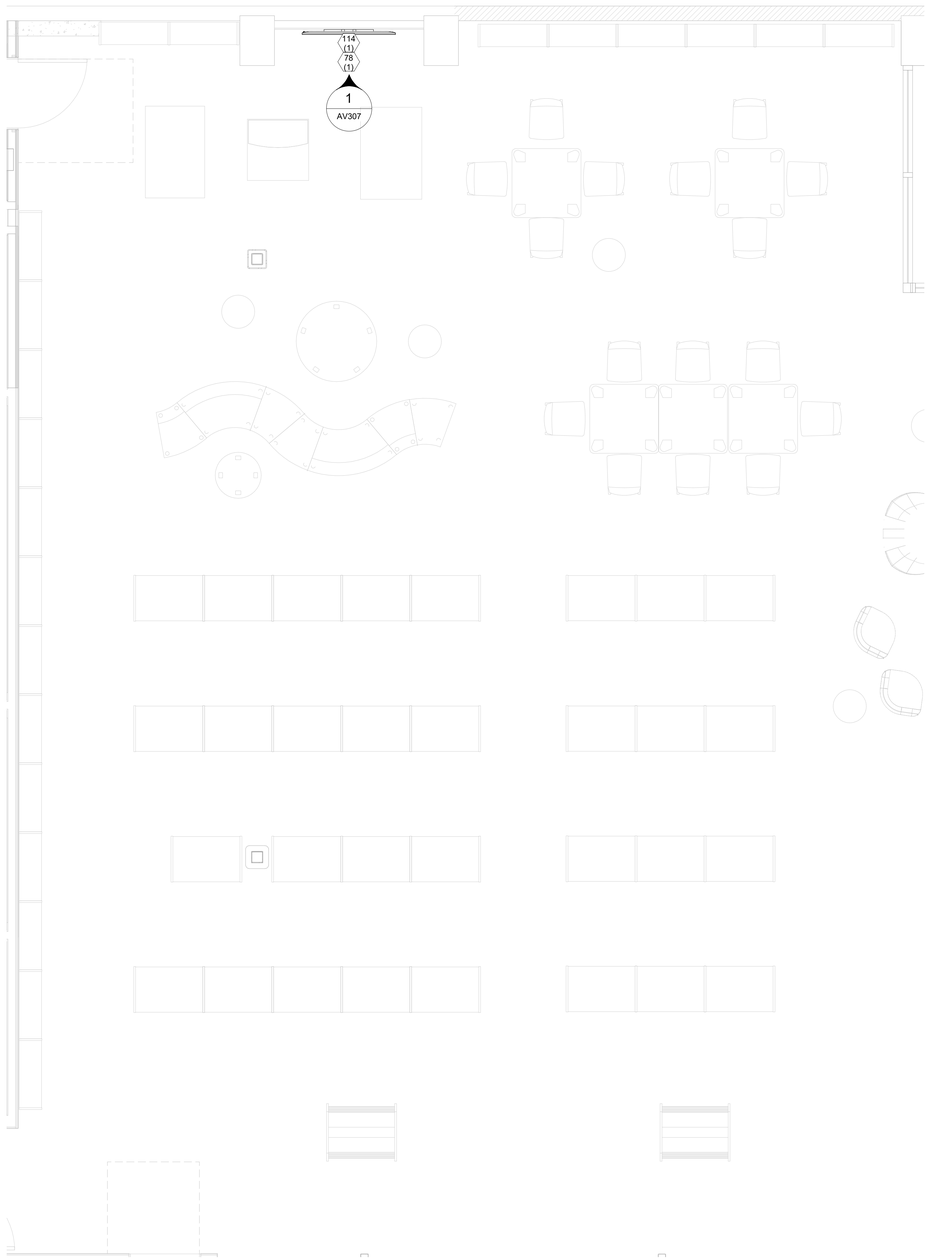
OPEN WORK AREA ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV206

8/14/2025 9:50:37 AM



1 DIGITAL SIGNAGE 2 ENLARGED PLAN
3/8" = 1'-0"

7 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV207
ELEVATION	1	AV307

7 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
78	1	43"	LG	55UH5C
114	1	57"	CHIEF	MTM1U

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

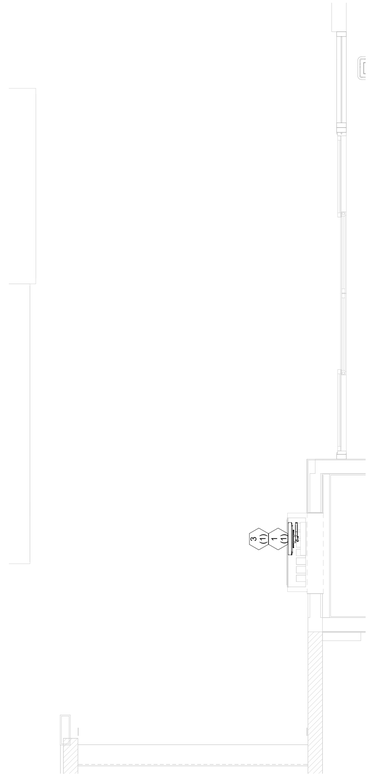
DIGITAL SIGNAGE 2 ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV207

8/14/2025 9:50:38 AM



1 DIGITAL SIGNAGE 3 IN KIOSK ENLARGED PLAN
3/8" = 1'-0"

9 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
FLOOR PLAN	1	AV209

9 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
1	1	56"	CHIEF	TS218SU
3	1	40 23/32"	LG	32SM5J-B

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 10:36:57 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

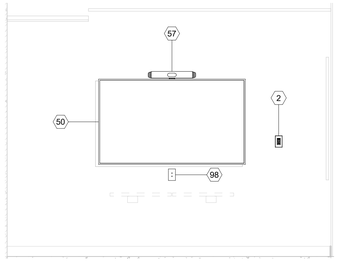
SHEET TITLE:

DIGITAL SIGNAGE 3 IN KIOSK ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV209



1 TELE MEETING ROOM ELEVATION
1/2" = 1'-0"

1 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV101
ENLARGED PLAN	1	AV201
ELEVATION	1	AV301

1 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
2	1	45"	CRESTRON	C2N-CBD-E
50	1	36"	LG	65UH5J
57	1	71 1/16"	POLY	R30
98	1	32"	CUSTOM	CUSTOM
112	1	52"	CHIEF	MTM1U

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

SHEET TITLE:

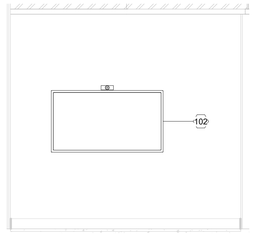
TELE MEETING ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV301

8/14/2025 9:50:39 AM



1 STAFF MEETING ROOM - EAST
1/2" = 1'-0"

2 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV202
ELEVATION	1	AV302

2 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
12	1	30"	EXTRON	CABLE CUBBY 500 60-1892-02
16	1	29"	POLY	TC8
102	1	30"	MICROSOFT	SURFACE HUB S2 50
111	1	42"	CHIEF	LTM1U
128	1	55 7/32"	MICROSOFT	SURFACE HUB CAMERA

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

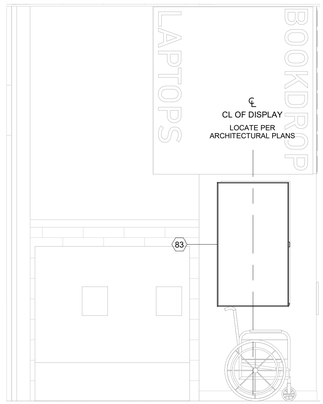
STAFF MEETING ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV302

8/14/2025 9:50:40 AM



1 DIGITAL SIGNAGE - SOUTH 2
NTS

3 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV203
ELEVATION	1	AV303

3 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
83	1	37"	LG	55UH5C
114	1	61 1/4"	CHIEF	MTM1U

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 9:50:40 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

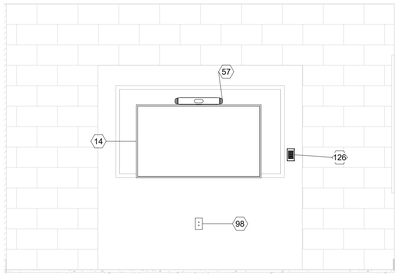
SHEET TITLE:

DIGITAL SIGNAGE SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV303



1 GAMING ROOM - SOUTH
1/2" = 1'-0"

4 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV204
ELEVATION	1	AV304

4 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
14	1	36"	LG	55UH5C
57	1	66"	POLY	R30
98	1	18"	CUSTOM	CUSTOM
112	1	51"	CHIEF	MTM1U
126	1	45"	CRESTRON	C2N-CBD-P

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

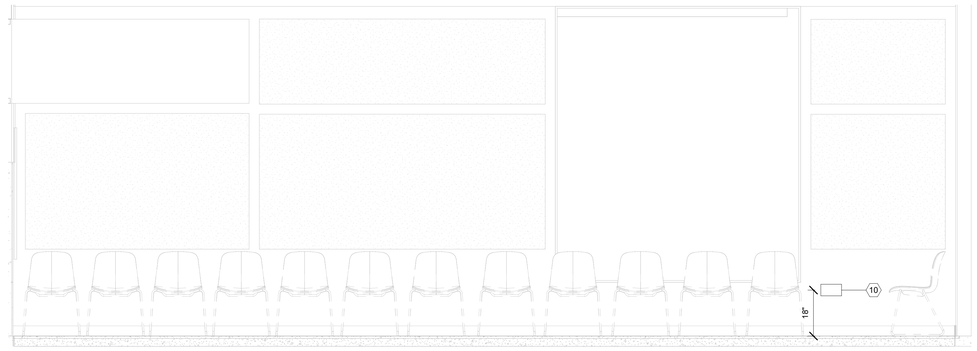
GAMING ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

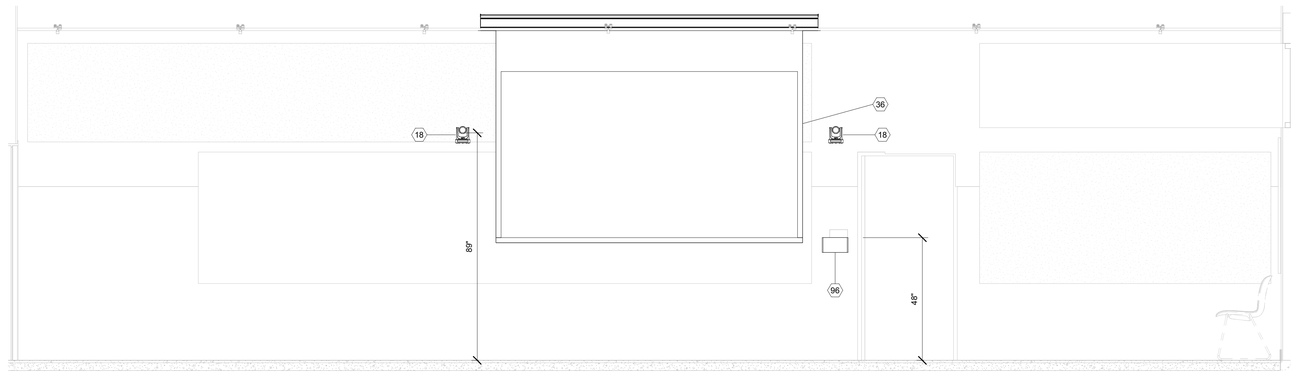
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV304

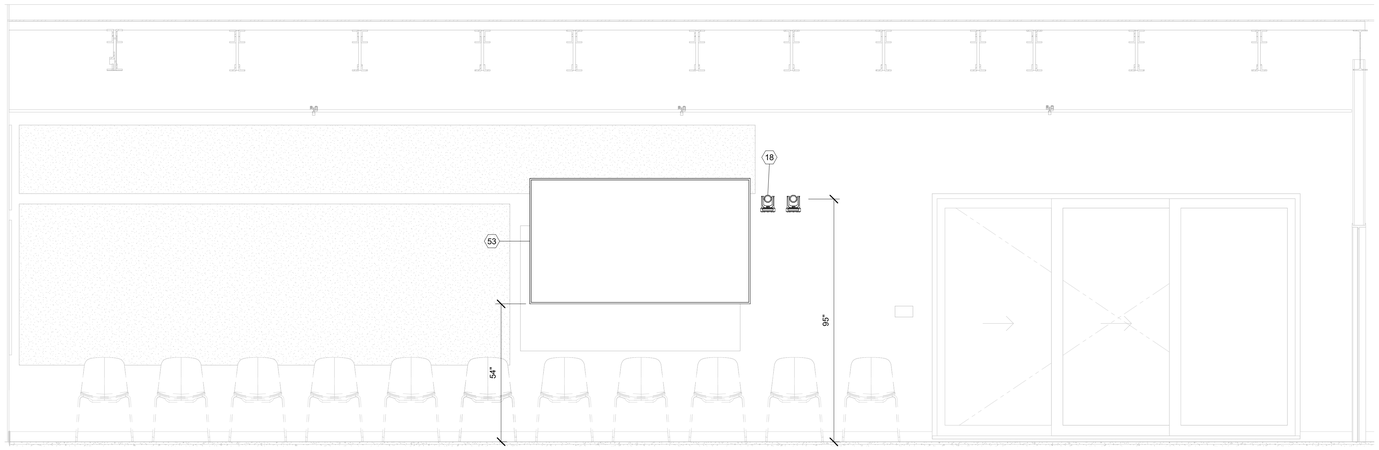
8/14/2025 9:50:40 AM



1 COMMUNITY ROOM - EAST
1/2" = 1'-0"



2 COMMUNITY ROOM - NORTH
1/2" = 1'-0"



3 COMMUNITY ROOM - SOUTH
1/2" = 1'-0"

5 - AV		
TYPE	DETAIL	SHEET

KEY PLAN	1	AV102
ENLARGED PLAN	1	AV205
ENLARGED RCP	2	AV205
ELEVATION	1	AV305
ELEVATION	2	AV305
ELEVATION	3	AV305

5 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
5	1	0"	MIDDLE ATLANTIC PRODUCTS	L5
10	1	18"	CUSTOM	CUSTOM
11	1	120"	DIGITAL PROJECTION	E-VISION LASER 11000 4K-UHD
13	9	127"	JBL	CONTROL 227CT
15	2	30"	OFE	TDB
18	2	85"	QSC	NC-12x80
18	2	90"	QSC	NC-12x80
20	1	30"	SKAARHOJ	PTZ FLY
36	1	129 1/8"	DRAPER	ACCESS E 133" - 139112U
53	1	54"	LG	98UH5J
56	1	0"	MIDDLE ATLANTIC PRODUCTS	WRK-44-32
59	1	79"	RPVISUALS	RPWM-32B-XM-OFFSET-NB
75	1	127"	SHURE	MXWAPT8
88	1	39"	CRESTRON	TS-770
89	1	30"	CRESTRON	TS-1070
90	4	33"	SHURE	MXW8=-Z10
91	4	35"	SHURE	MX410LP/C
96	1	47"	CRESTRON	TSW-1070
99	1	127"	LISTEN TECHNOLOGIES	LA-123

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2026/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

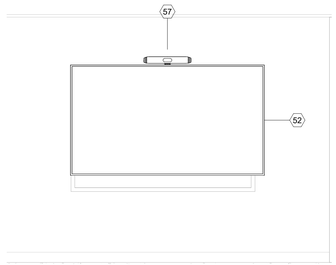
COMMUNITY ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV305

8/14/2025 9:50:42 AM



1 OPEN WORK AREA - SOUTH 3
1/2" = 1'-0"

6 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV206
ELEVATION	1	AV306

6 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
52	1	34"	LG	86UH5J
57	1	79 3/16"	POLY	R30
117	1	56"	CHIEF	AS3LD

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 9:50:42 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

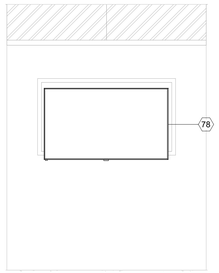
SHEET TITLE:

OPEN WORK AREA SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV306



1 DIGITAL SIGNAGE 2 ELEVATION
1/2" = 1'-0"

7 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV207
ELEVATION	1	AV307

7 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
78	1	43"	LG	55UH5C
114	1	57"	CHIEF	MTM1U

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 9:50:43 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

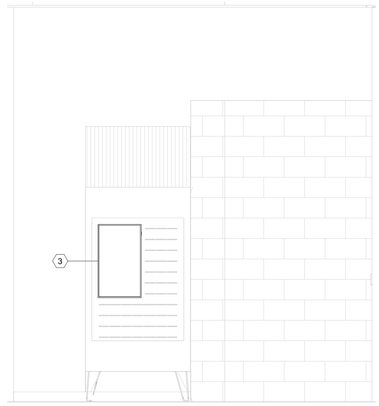
SHEET TITLE:

DIGITAL SIGNAGE 2 SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV307



1 DIGITAL SIGNAGE 3 IN KIOSK ELEVATION
1/2" = 1'-0"

9 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
FLOOR PLAN	1	AV209
ELEVATION	1	AV309

9 - AV EQUIPMENT				
ID	COUNT	AFF	MAKE	MODEL
1	1	56"	CHIEF	TS218SU
3	1	40 23/32"	LG	32SM5J-B

ALL ELEVATION DIMENSIONS ARE FROM FINISHED FLOOR TO BOTTOM OF DEVICE UNLESS OTHERWISE NOTED.

8/14/2025 10:55:13 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

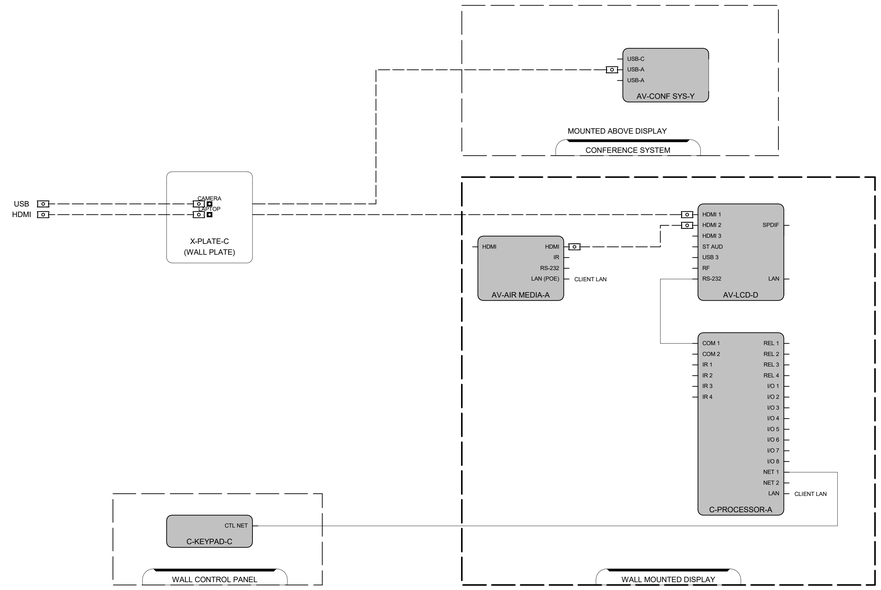
SHEET TITLE:

DIGITAL SIGNAGE 3 IN KIOSK SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV309



01-TELE MEETING ROOM

1 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV101
ENLARGED PLAN	1	AV201
ELEVATION	1	AV301

8/14/2025 9:50:44 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expiration Date
2026/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

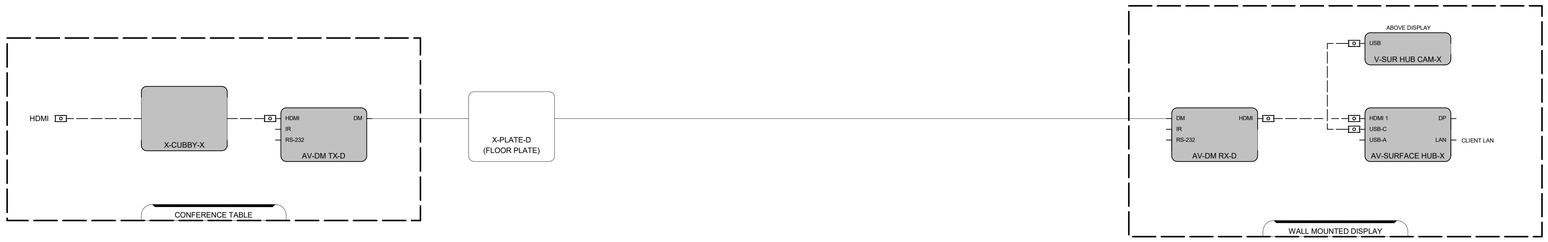
SHEET TITLE:

TELE MEETING ROOM LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV401



02-STAFF MEETING ROOM

2 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV202
ELEVATION	1	AV302

8/14/2025 9:50:44 AM

ANDERSON BRULÉ
ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expiration Date
2026/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

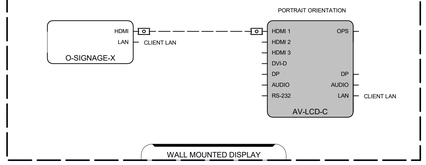
SHEET TITLE:

STAFF MEETING ROOM LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV402



03-DIGITAL SIGNAGE

3 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV203
ELEVATION	1	AV303

8/14/2025 9:58:45 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

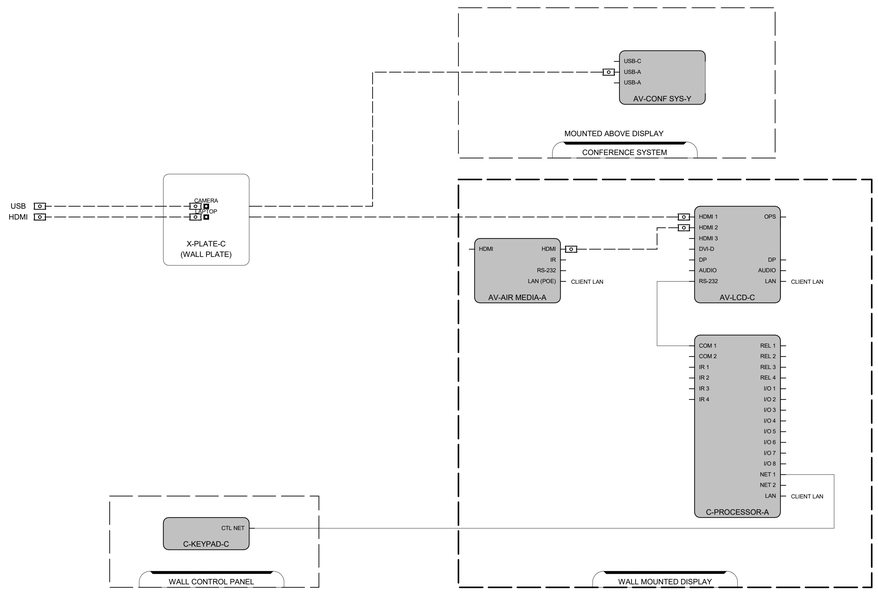
SHEET TITLE:

DIGITAL SIGNAGE LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV403



04-GAMING ROOM

B1/4/2025 9:50:45 AM

ANDERSON BRULÉ
ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRATION DATE
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

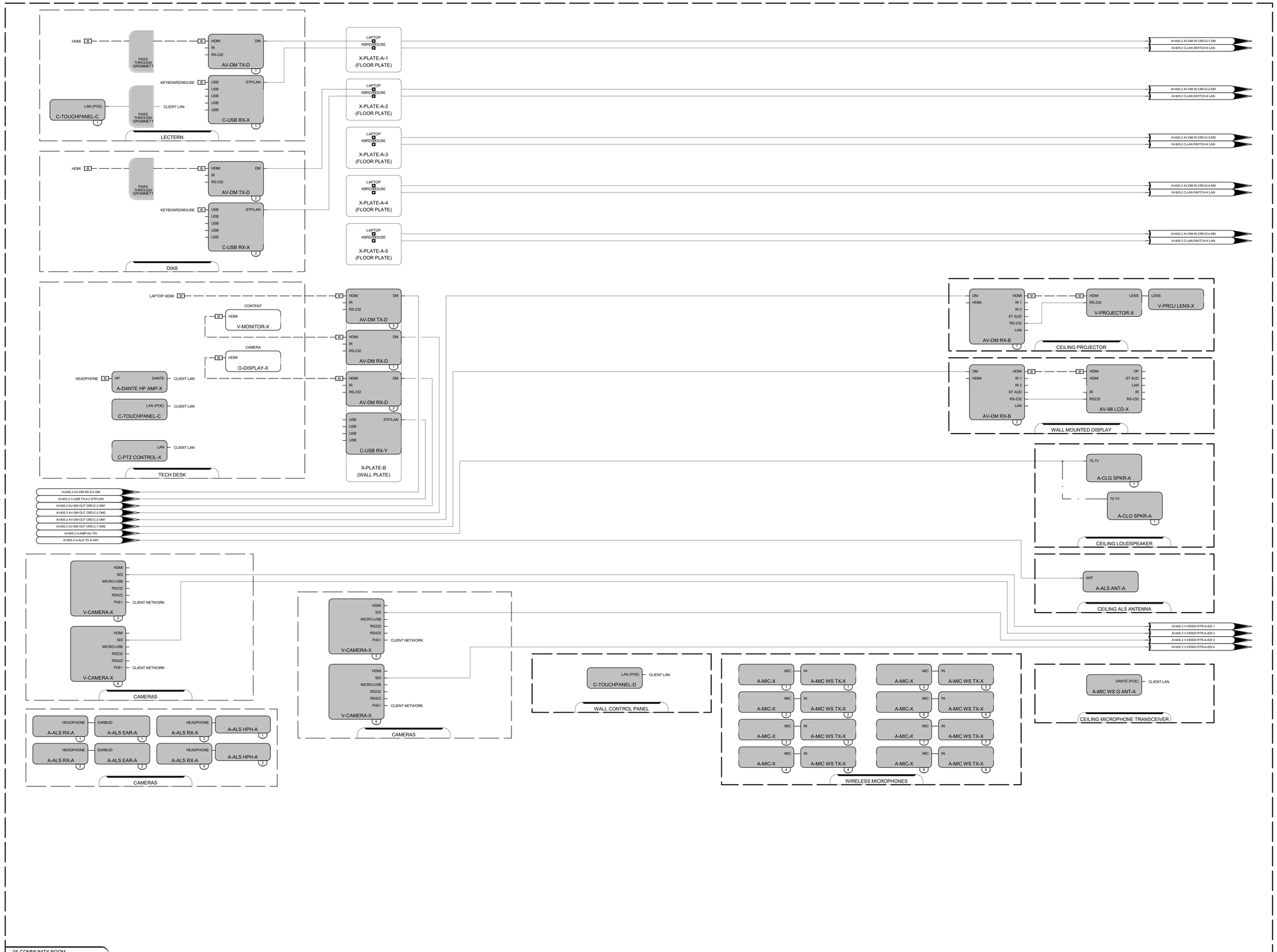
SHEET TITLE:

GAMING ROOM LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV404



5 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV205
ENLARGED RCP	2	AV205
ELEVATION	1	AV305
ELEVATION	2	AV305
ELEVATION	3	AV305

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2026/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

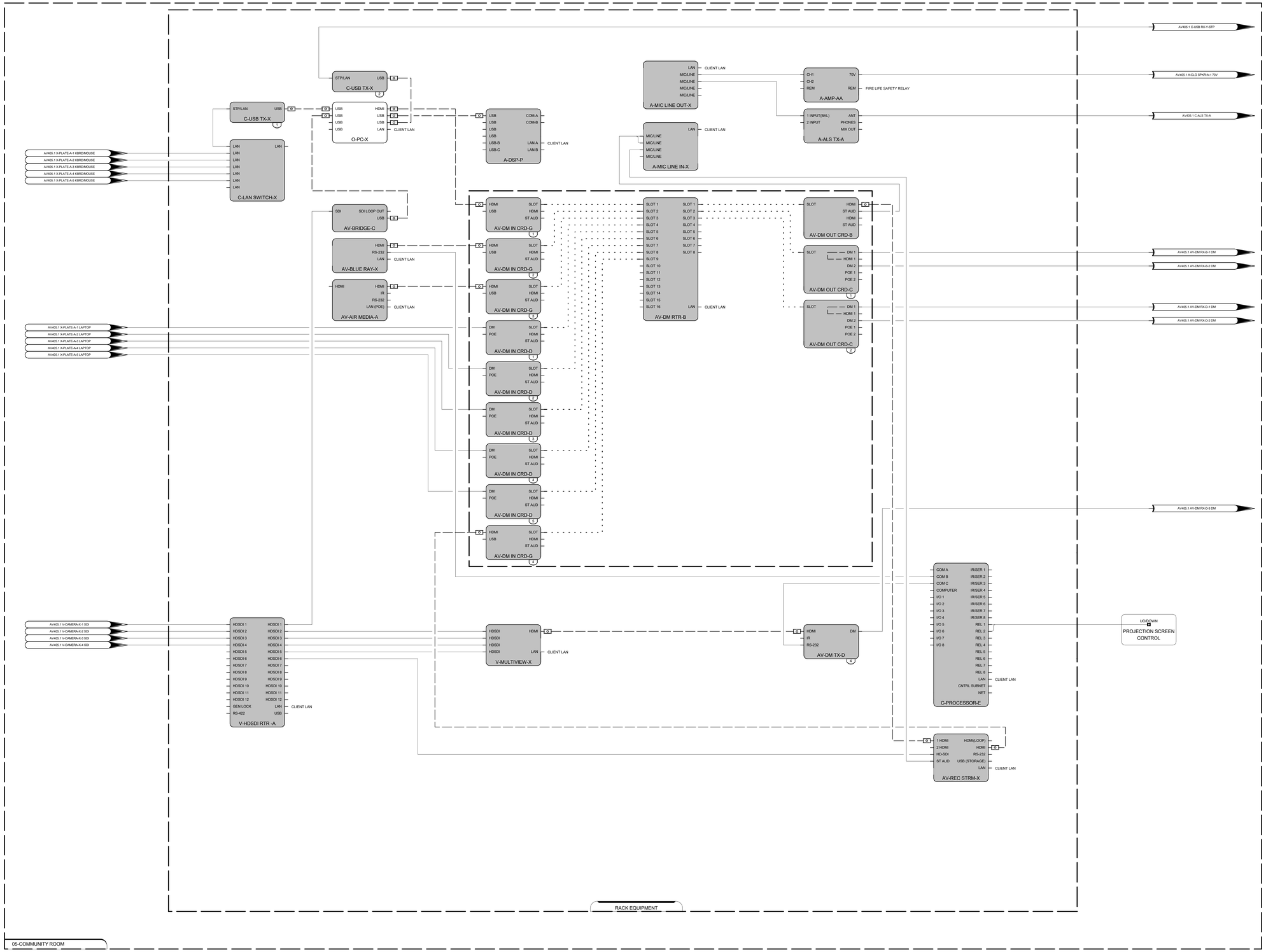
COMMUNITY ROOM LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV405

8/14/2025 9:50:45 AM



ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRES
2026/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

COMMUNITY ROOM LINE DIAGRAM

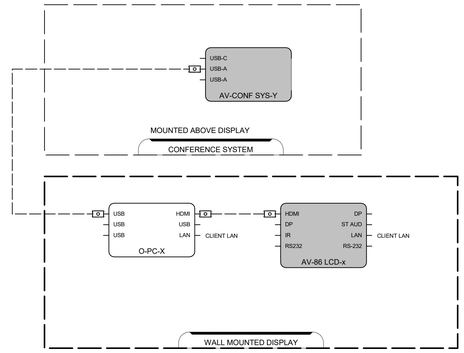
SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

©

AV405.2

8/14/2025 9:50:45 AM



06-OPEN WORK AREA

6 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV206
ELEVATION	1	AV306

8/14/2025 9:50:46 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2026/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

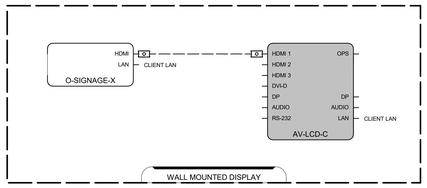
SHEET TITLE:

OPEN WORK AREA LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV406



07-DIGITAL SIGNAGE 2

7 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
ENLARGED PLAN	1	AV207
ELEVATION	1	AV307

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRATION DATE
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

SHEET TITLE:

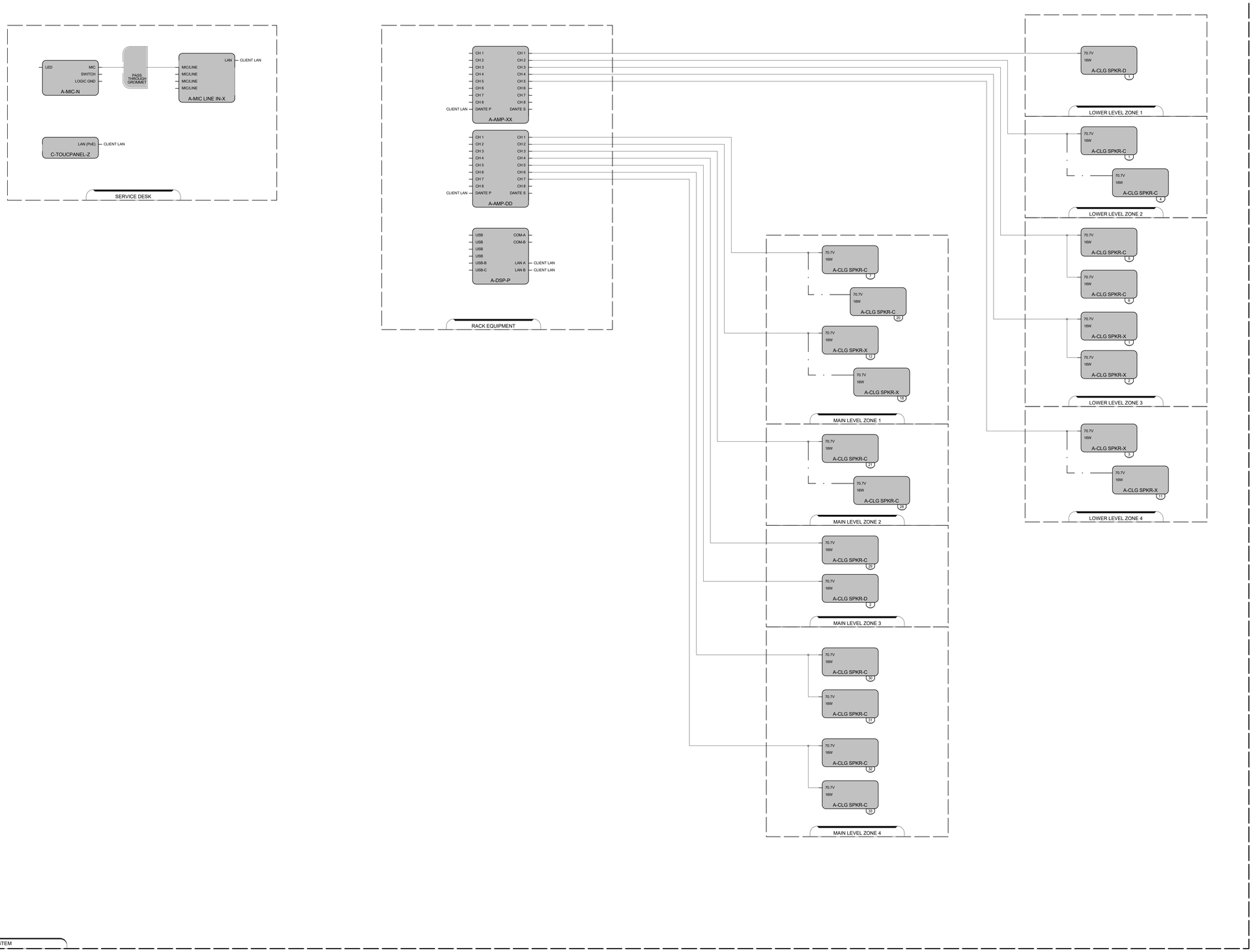
DIGITAL SIGNAGE 2 LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV407

8/14/2025 9:50:46 AM



ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

have not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result.

CONSULTANTS LOGO

STAMP

NOT FOR CONSTRUCTION

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

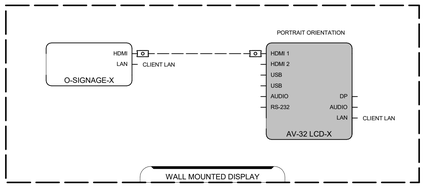
PAGING LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV408

8/14/2025 5:50:46 AM



09-DIGITAL SIGNAGE 3 IN KIOSK

9 - AV		
TYPE	DETAIL	SHEET
KEY PLAN	1	AV102
FLOOR PLAN	1	AV209

8/14/2025 9:50:47 AM

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
6726546
Expires
2026/03/31

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

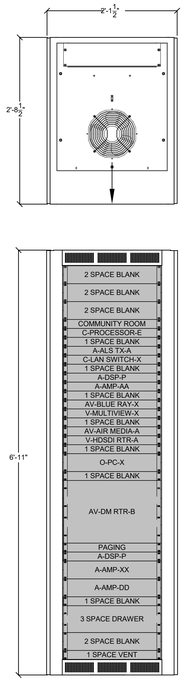
SHEET TITLE:

DIGITAL SIGNAGE 3 IN KIOSK LINE DIAGRAM

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV409



NOTE:
AV INTEGRATOR TO PROVIDE SIDE PANELS, REAR DOOR, AND FAN TOP.

ENSURE ENOUGH VENTILATION FOR AIR FLOW

MOUNT EQUIPMENT LESS THAN ONE RACK SPACE ON SHELF WITH BLANK PANEL COVER

1 COMMUNITY ROOM RACK ELEVATION
NTS

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

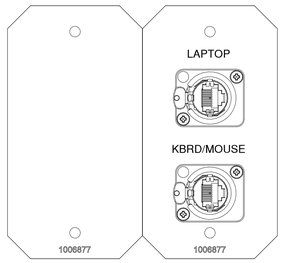
RACK ELEVATIONS

SCALE: 1" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV501

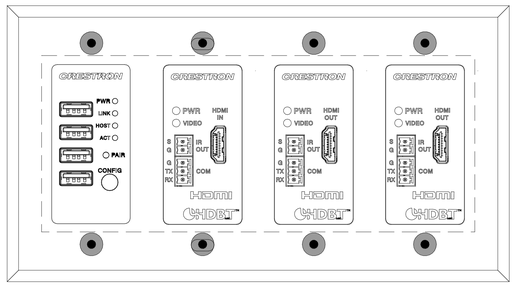
8/14/2025 9:50:47 AM



X-PLATE-A

QTY 2, LEGRAND 8B
QTY 2, ETHERCON

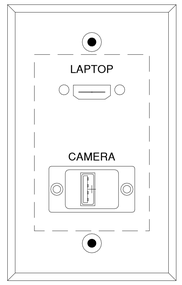
1 X-PALTE-A
NTS



X-PLATE-D
4 GANG PLATE

QTY 1, C-USB RX-Y
QTY 1, AV-DM TX-D
QTY 2, AV-DM RX-D

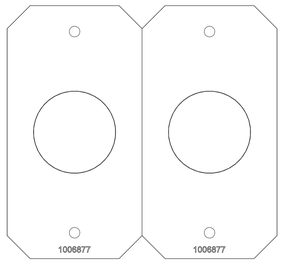
2 X-PLATE-B
NTS



X-PLATE-C
1 GANG PLATE WITH

QTY 1, HDMI
QTY 1, USB-A

3 X-PLATE-C
NTS



X-PLATE-D

QTY 2, LEGRAND 8S2

4 X-PLATE-D
NTS

8/14/2025 9:50:47 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires:
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

CUSTOM PLATES

SCALE: 12" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

AV601

AV INFRASTRUCTURE SHEET SET	
Sheet Number	Sheet Name
0 - LEGEND	
EAV000	LEGEND
00 - LEGEND	
EAV001	PROJECT DETAILS
EAV002	PROJECT DETAILS
10-PLANS	
EAV100	LOWER LEVEL - EAV PLAN
EAV102	MAIN LEVEL - EAV PLAN
EAV102A	MAIN LEVEL ALT - EAV PLAN
20-ENLARGED	
EAV201	TELE MEETING ROOM ENLARGED PLANS
EAV202	STAFF MEETING ROOM ENLARGED PLANS
EAV204	GAMING ROOM ENLARGED PLANS
EAV205	COMMUNITY ROOM ENLARGED PLANS
EAV203	DIGITAL SIGNAGE ENLARGED PLANS
EAV206	OPEN WORK AREA ENLARGED PLANS
EAV207	DIGITAL SIGNAGE 2 ENLARGED PLANS
EAV101P	LOWER LEVEL - EAV PAGING PLAN
EAV102P	MAIN LEVEL - EAV PAGING PLAN
30-SECTIONS AND ELEVATIONS	
EAV301	TELE MEETING ROOM SECTIONS AND ELEVATIONS
EAV302	STAFF MEETING ROOM SECTIONS AND ELEVATIONS
EAV303	DIGITAL SIGNAGE SECTIONS AND ELEVATIONS
EAV304	GAMING ROOM SECTIONS AND ELEVATIONS
EAV305	COMMUNITY ROOM SECTIONS AND ELEVATIONS
EAV306	OPEN WORK AREA SECTIONS AND ELEVATIONS
EAV307	DIGITAL SIGNAGE 2 SECTIONS AND ELEVATIONS

EXAMPLE SHEET SET		
Sheet Number	Sheet Name	
0 - LEGEND		
000	LEGEND	0
1 - KEY PLANS		
101	KEY PLANS - LEVEL 01	1
102	KEY PLANS - LEVEL 02	
2 - ENLARGEMENTS		
201	ENLARGED PLANS - SYSTEM 01	2
202	ENLARGED PLANS - SYSTEM 02	
3 - ELEVATIONS AND SECTIONS		
301	ELEVATIONS AND SECTIONS - SYSTEM 01	3
302	ELEVATIONS AND SECTIONS - SYSTEM 02	
4 - LINE DIAGRAMS		
401	LINE DIAGRAMS - SYSTEM 01	4
402	LINE DIAGRAMS - SYSTEM 02	
5 - RACK ELEVATIONS		
501	RACK ELEVATIONS	5
6 - CUSTOM PLATES		
601	CUSTOM PLATES	6

SHEET LIST NAVIGATION	
ID	DESCRIPTION
0	SHEET LIST AND DRAWING SYMBOL LEGENDS
1	OVERALL KEY PLANS INDICATING SYSTEM LOCATIONS - SHEET NUMBER CORRESPONDS WITH LEVEL
2	ENLARGED PLANS PER SYSTEM - SHEET NUMBER CORRESPONDS TO SYSTEM ID
3	ELEVATIONS AND SECTIONS PER SYSTEM - SHEET NUMBER CORRESPONDS TO SYSTEM ID
4	LINE DIAGRAMS PER SYSTEM - SHEET NUMBER CORRESPONDS TO SYSTEM ID (AV ONLY)
5	AV EQUIPMENT RACK ELEVATIONS (AV ONLY)
6	CUSTOM PLATES AND METAL WORK (AV ONLY)

AV INFRASTRUCTURE ADDITIONAL INFORMATION			
MANUFACTURER	MODEL	DESCRIPTION	ADDITIONAL INFORMATION
AtlasIED	FA97-8	CEILING BOX	
LEGRAND	8ATC	FLOOR BOX	PROVIDE TWO (2) 68REC AND A TOTAL OF THREE OF THE FOLLOWING: ONE (1) 175CHA-LJB FOR EACH .75" CONDUIT REQUIRED ONE (1) 1100CHA FOR EACH 1" CONDUIT REQUIRED ONE (1) 1125CHA FOR EACH 1.25" CONDUIT REQUIRED ONE (1) 1150CHA FOR EACH 1.5" CONDUIT REQUIRED (TAKES TWO SLOTS) ONE (1) 22CHA FOR EACH 2" CONDUIT REQUIRED (TAKES TWO SLOTS) 1BLH AS REQUIRED TO FILL REMAINING SLOTS
N/A	PASS-THRU STUB	CEILING PATHWAY	
RACO	689	CEILING BOX	

AV INFRASTRUCTURE SYMBOLS	
	DESCRIPTION
	CEILING BOX
	CEILING PATHWAY
	FLOOR BOX
	WALL BOX

SEE 200 SERIES SHEETS AND SCHEDULES

INFRASTRUCTURE NOTES	
ID	Note
(1)	ALL ELEVATION DIMENSIONS ARE MEASURED FROM FINISHED FLOOR TO CENTER OF BOX. ALL INDICATIONS OF 18" AFF ARE INTENDED TO BE PROJECT RECEPTACLE HEIGHT.
(2)	ALL STUBS ACCESSABLE TO ABOVE FINISHED CEILING UNLESS OTHERWISE NOTED.
(3)	PROVIDE CABLE TRAY AT 7'6" AFF ABOVE ALL AV EQUIPMENT RACKS GREATER THAN 37RU. TROUGH OR STUBS DIRECTLY OVER SINGLE RACK AGAINST WALL WILL BE ACCEPTABLE.

CONDUIT INSTALLATION NOTES	
ID	ASSOCIATED WITH DIVISION 26
	THE RACEWAY SYSTEM FOR AV CABLE SHALL FOLLOW THE NEC AND ALL LOCAL CODES GOVERNING THIS PROJECT. ADDITIONAL REQUIREMENTS ARE AS FOLLOWS:
1	ALL RACEWAY SHOWN IN THESE "EAV" DRAWINGS IS FOR AV CABLE, AND IS IN ADDITION TO ANY CONDUIT SHOWN ON ANY OTHER DRAWINGS.
2	ROUTING OF CONDUIT SHOWN FOR DESIGN INTENT ONLY. COORDINATE EXACT ROUTE BASED ON FIELD CONDITIONS.
3	ALL CONDUIT CONNECTORS SHALL BE FURNISHED WITH NYLON BUSHINGS AND CHASE NIPPLES TO PREVENT DAMAGE TO CABLES FROM BURRED OR UNEVENLY CUT CONDUIT.
4	KEEP 90° BENDS TO A MINIMUM. THE CONDUIT SYSTEM SHALL NOT HAVE MORE THAN THREE 90° BENDS OR THEIR EQUIVALENT (270°) BETWEEN PULL BOXES.
5	ALL PULL BOXES AND OUTLET BOXES SHALL BE AT LEAST 3.5" DEEP.
6	INSTALL NYLON PULL STRINGS IN ALL CONDUITS.
7	CAULK OR OTHERWISE SEAL ALL PENETRATIONS THROUGH ACOUSTICAL PARTITIONS AND BARRIERS WITH ACOUSTICAL SEALANT. SEE DIV. 7 SEALANT SECTION.
8	ALL AV RELATED JUNCTION BOXES AND STUB OUTS SHALL REMAIN ACCESSIBLE AT ALL TIMES.
9	THE STANDARD SIZE FOR ALL AV CONDUIT SHALL BE 0.75" UNLESS OTHERWISE NOTED. ALL EXPOSED CONDUIT SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO STRUCTURE ABOVE.
10	WHERE CONDUIT CONNECTS CEILING SPEAKER ENCLOSURES, THE ENCLOSURES, AND ASSOCIATED SUPPORT HARDWARE SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
11	CEILING SPEAKERS ARE SHOWN FOR ZONING AND CONDUIT SIZING AND ROUTING ONLY. REFERENCE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT CEILING SPEAKER LOCATIONS.
12	ALL CONDUIT SHALL BE (EMT) ELECTRICAL METAL TUBING OR (IMC) INTERMEDIATE METALLIC CONDUIT UNLESS OTHERWISE NOTED.
13	PVC IS UNACCEPTABLE UNLESS OTHERWISE NOTED.
14	CONDUIT RUNS NOT TO EXCEED 90M FROM END TO END ON ANY PATHWAY.
15	PROVIDE UNOBSTRUCTED PATH FROM ALL AV SPACES TO IDF/AV RACK ROOM.

	THIS SYMBOL DESIGNATES AN AV ENABLED SPACE. THE NUMBER INDICATES THE ASSOCIATED SYSTEM ID. THE ARROW INDICATES ROOM FOCUS OR PRIMARY USER ENGAGEMENT DIRECTION.

8/14/2025 9:53:13 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRATION DATE
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

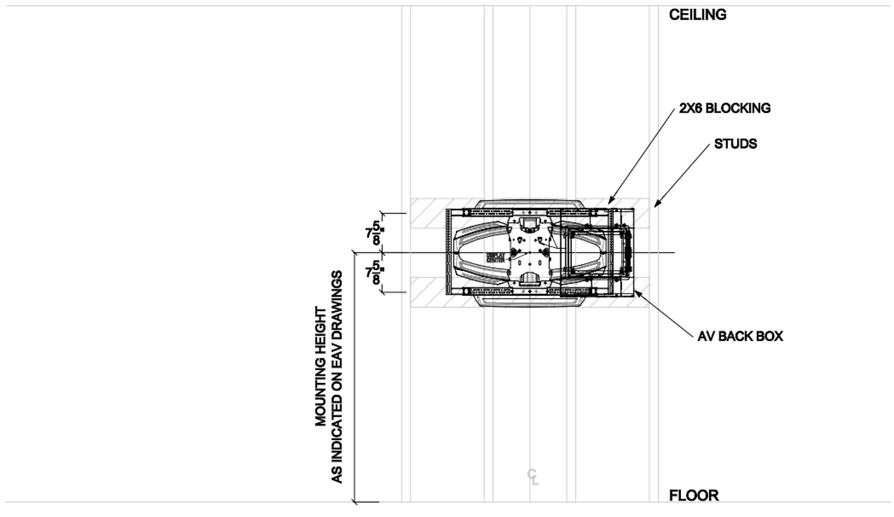
SHEET TITLE:

LEGEND

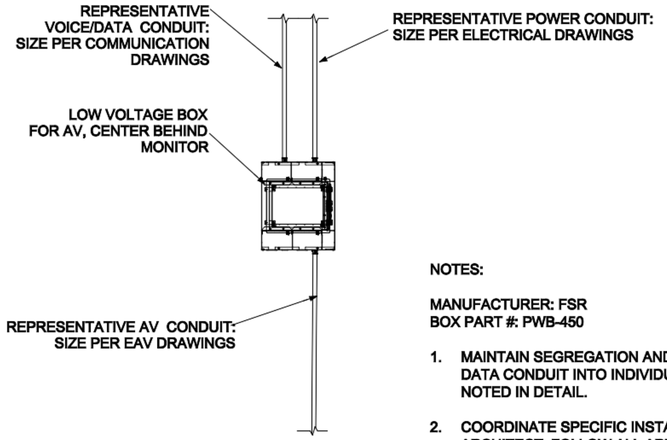
SCALE:

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV000



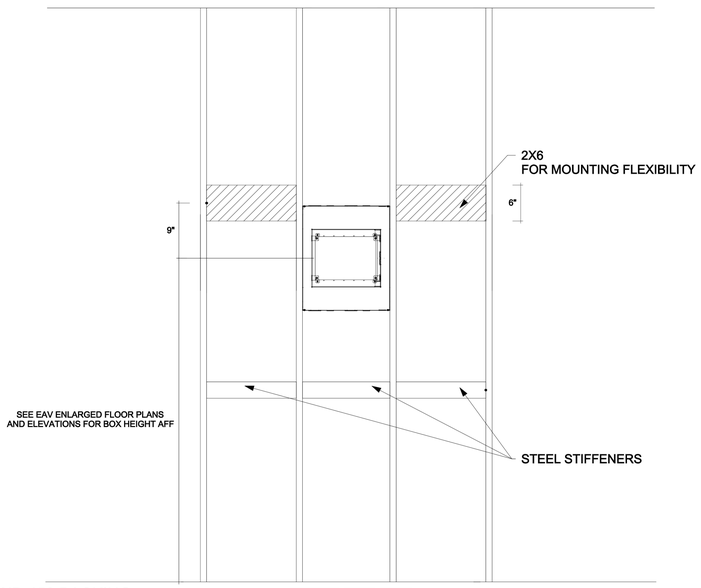
2 FSR PWB-450
NTS



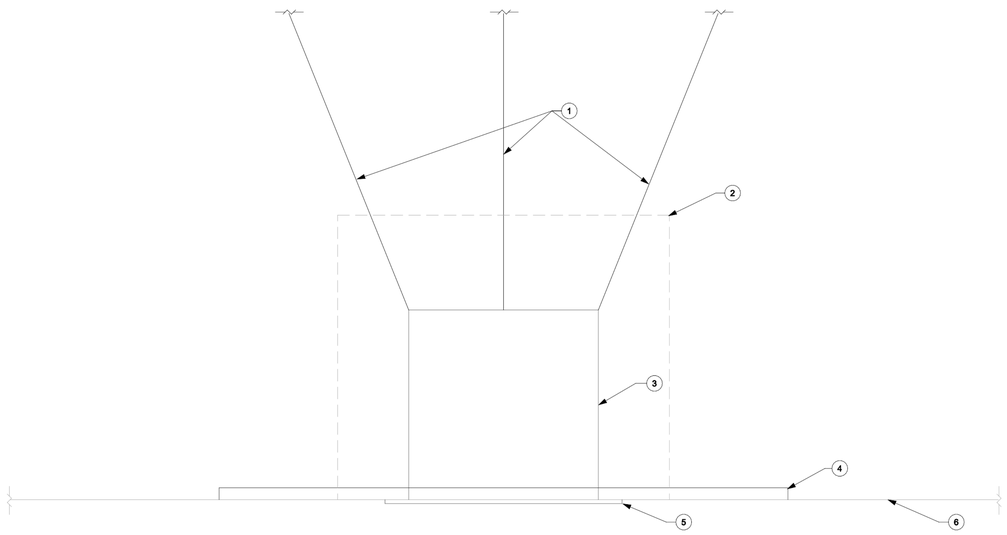
NOTES:

MANUFACTURER: FSR
BOX PART #: PWB-450

1. MAINTAIN SEGREGATION AND ENTRY OF AV, POWER, AND DATA CONDUIT INTO INDIVIDUAL COMPARTMENTS AS NOTED IN DETAIL.
2. COORDINATE SPECIFIC INSTALLATION DETAILS WITH ARCHITECT, FOLLOW ALL APPLICABLE CODES.



3 FSR PWB-450 BACKING
NTS



NOTES:
1. SAFETY AND SUPPORT CABLES. QUANTITY AND LOCATION PER PRODUCT INSTRUCTIONS AND APPLICABLE CODES
2. CLEAR SPACE REQUIRED ABOVE CEILING FOR SPEAKER BACK CAN AND CONNECTION ACCESSORIES
3. SPEAKER BACK CAN
4. TILE BRIDGE, PRE-CONSTRUCTION BRACKET OR POST-CONSTRUCTION BRACKET - SEE INSTALLATION INSTRUCTIONS
5. SPEAKER GRILL/COVER - SEE INSTALLATION INSTRUCTIONS
6. FINISHED CEILING

1 CEILING SPEAKER INSTALLATION CONCEPT
NTS

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expiration Date
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

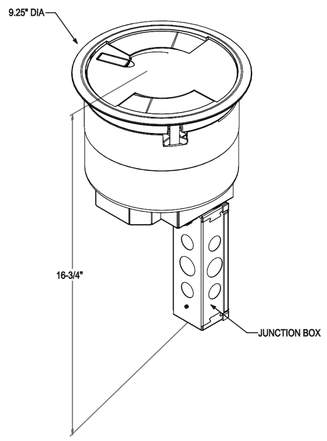
PROJECT DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV001

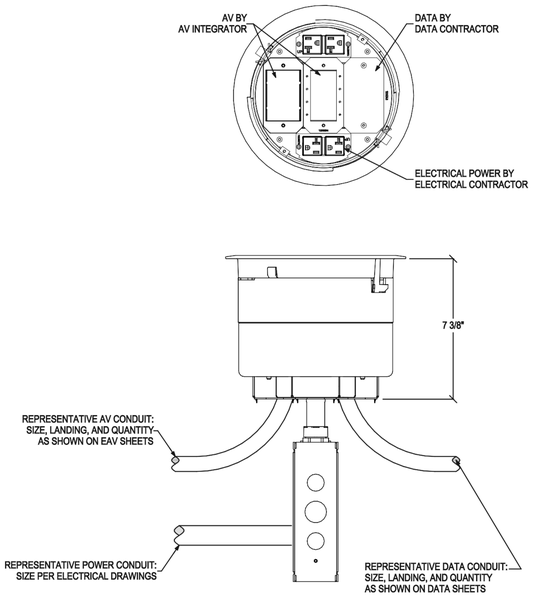
8/14/2025 9:53:14 AM



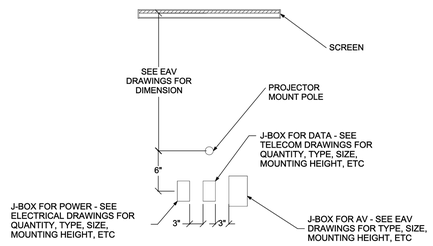
NOTES: (THIS DETAIL ONLY)

MANUFACTURER: LEGRAND
BOX PART #: 8ATC
COVER: PART #8CTCXX - COORDINATE FINISH WITH THE ARCHITECT.

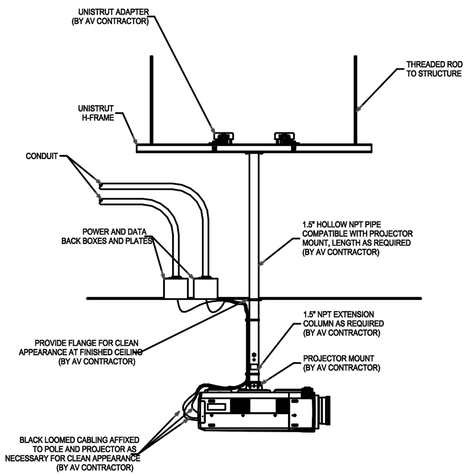
1. MAINTAIN SEGREGATION AND ENTRY OF AV, POWER, AND DATA CONDUIT INTO INDIVIDUAL COMPARTMENTS AS NOTED IN DETAIL.
2. COORDINATE SPECIFIC INSTALLATION DETAILS WITH ARCHITECT, FOLLOW ALL APPLICABLE CODES.
3. FLOOR BOXES SHALL BE PROVIDED AS SHOWN ON THE EAV DRAWINGS. FLOOR BOXES AND CONDUIT TO BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.



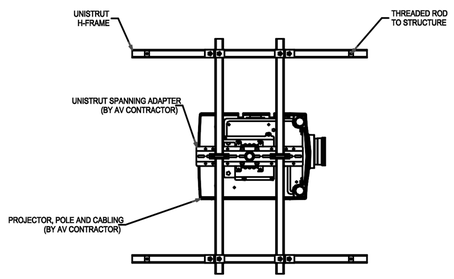
3 LEGRAND 8ATC
NTS



1 PROJECTOR AND SCREEN COORDINATION
NTS



2 PROJECTOR MOUNTING
NTS



NOTES: (THIS DETAIL ONLY)

1. CEILING NOT SHOWN FOR CLARITY.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

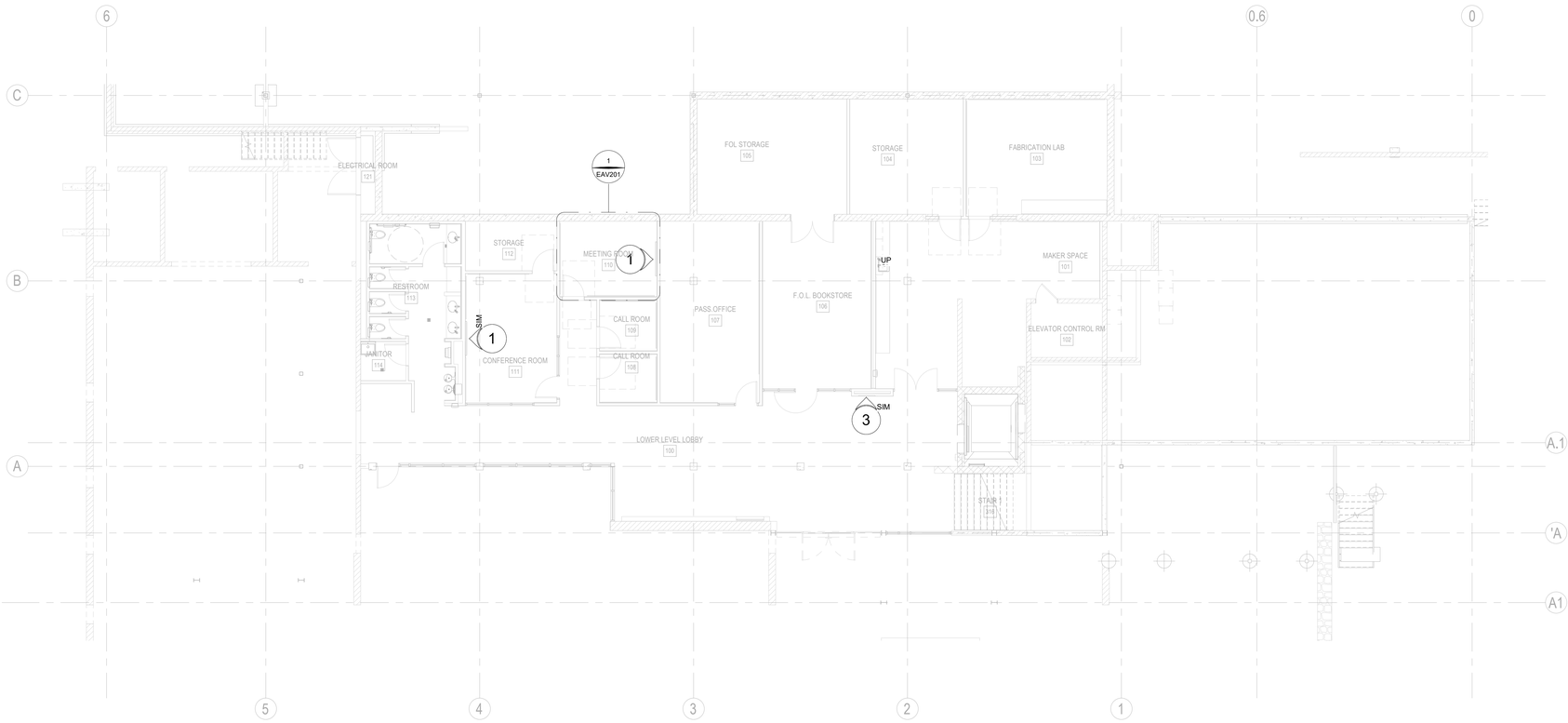
PROJECT DETAILS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

EAV002

8/14/2025 9:53:14 AM



LOWER LEVEL - EAV		
RM#	ROOM	LAYOUT
1 - TELE MEETING ROOM		
111	CONFERENCE ROOM	A
110	MEETING ROOM	A
2		
3 - DIGITAL SIGNAGE		
100	LOWER LEVEL LOBBY	A
1		

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

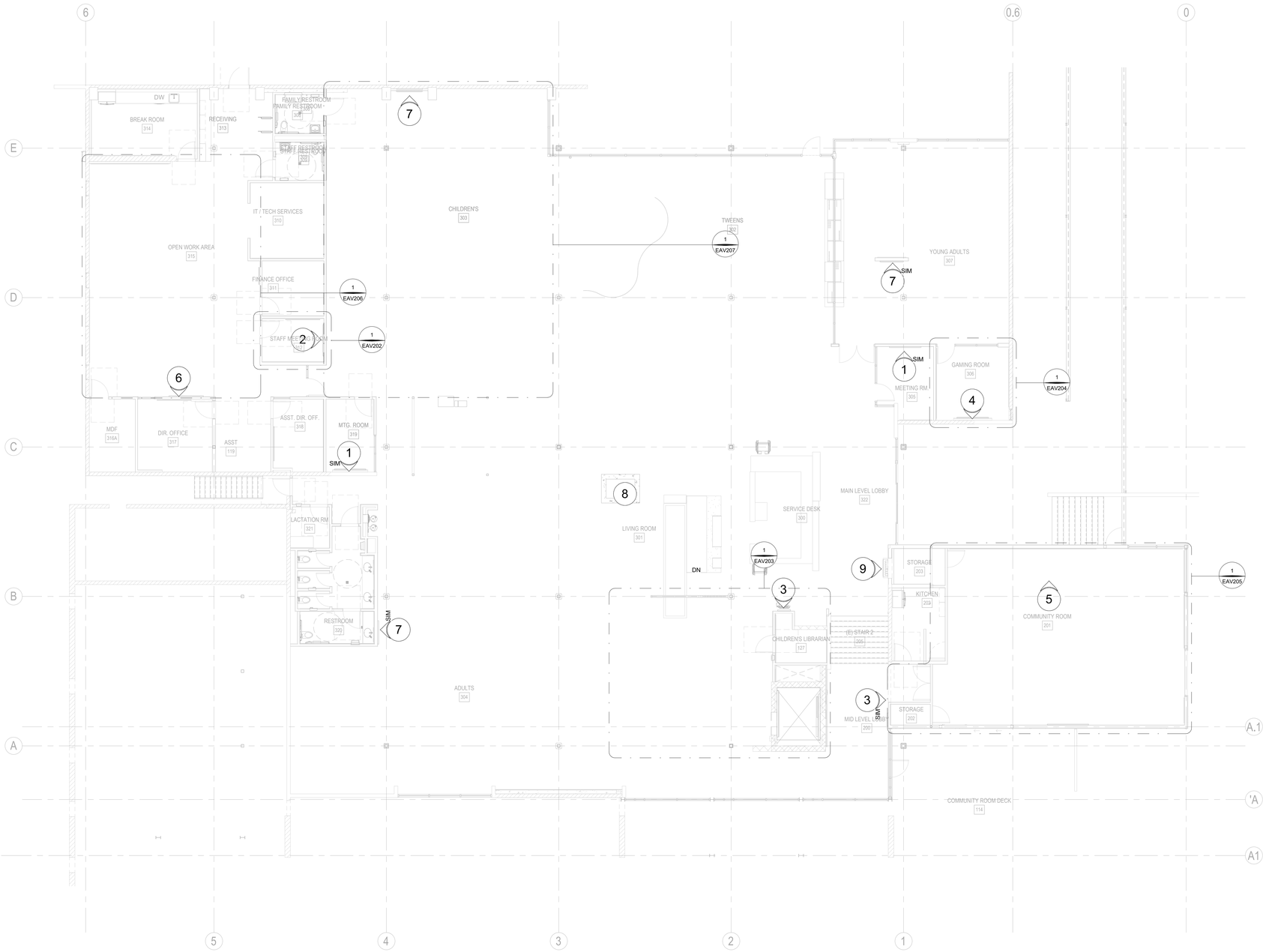
LOWER LEVEL - EAV PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV100

8/14/2025 9:53:15 AM



MAIN LEVEL - EAV		
RM#	ROOM	LAYOUT
1 - TELE MEETING ROOM		
319	MTG. ROOM	A
1		
2 - STAFF MEETING ROOM		
312	STAFF MEETING ROOM	A
1		
3 - DIGITAL SIGNAGE		
300	SERVICE DESK	A
1		
5 - COMMUNITY ROOM		
201	COMMUNITY ROOM	A
1		
6 - OPEN WORK AREA		
315	OPEN WORK AREA	A
1		
7 - DIGITAL SIGNAGE 2		
303	CHILDREN'S	A
307	YOUNG ADULTS	A
2		
8 - PAGING		
301	LIVING ROOM	A
1		
9 - DIGITAL SIGNAGE 3 IN KIOSK		
322	MAIN LEVEL LOBBY	A
1		

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
EXPIRATION DATE
2025/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

MAIN LEVEL - EAV PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects.

©

EAV102

8/14/2025 10:36:57 AM



MAIN LEVEL ALT - EAV		
RM#	ROOM	LAYOUT
1 - TELE MEETING ROOM		
322	ADD ALT MTG ROOM	A
1		

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2022/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

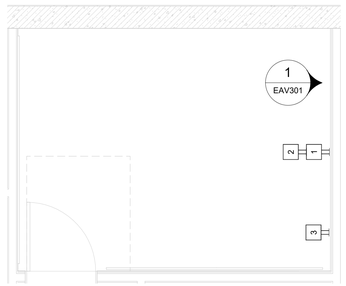
MAIN LEVEL ALT - EAV PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV102A

8/14/2025 10:36:58 AM



1 TELE MEETING ROOM LAYOUT A ENLARGED PLAN
3/8" = 1'-0"

1 - EAV		
TYPE	DETAIL	SHEET

KEY PLAN	1	EAV100
ENLARGED PLAN	1	EAV201
ELEVATION	1	EAV301

1 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	32"	RACO	689	ONE 1 1/4" TO BOX	2
2	52"	FSR INC	PWB-FR-450 WHT		
3	45"	RACO	689	ONE 1" TO BOX	2

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:18 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

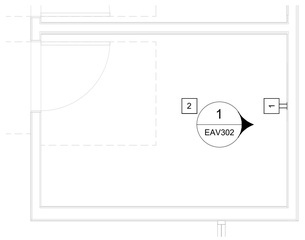
SHEET TITLE:

TELE MEETING ROOM ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV201



1 STAFF MEETING ROOM ENLARGED PLAN
3/8" = 1'-0"

2 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV202
ELEVATION	1	EAV302

2 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	42"	FSR INC	PWB-FR-450 WHT		
2	0"	LEGRAND	8ATC	ONE 1" TO BOX	1

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:18 AM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

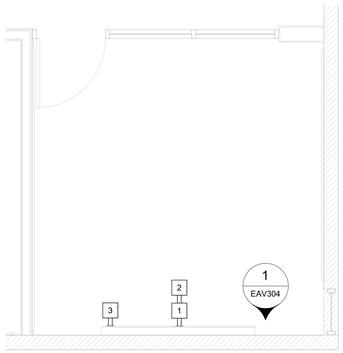
SHEET TITLE:

STAFF MEETING ROOM ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV202



1 GAMING ROOM
3/8" = 1'-0"

4 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV204
ELEVATION	1	EAV304

4 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	18"	RACO	985	ONE 1 1/4" TO BOX	2
2	51"	FSR INC	PWB-FR-450 WHT		
3	45"	RACO	689	ONE 1" TO BOX	2

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:19 AM

ABA
ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

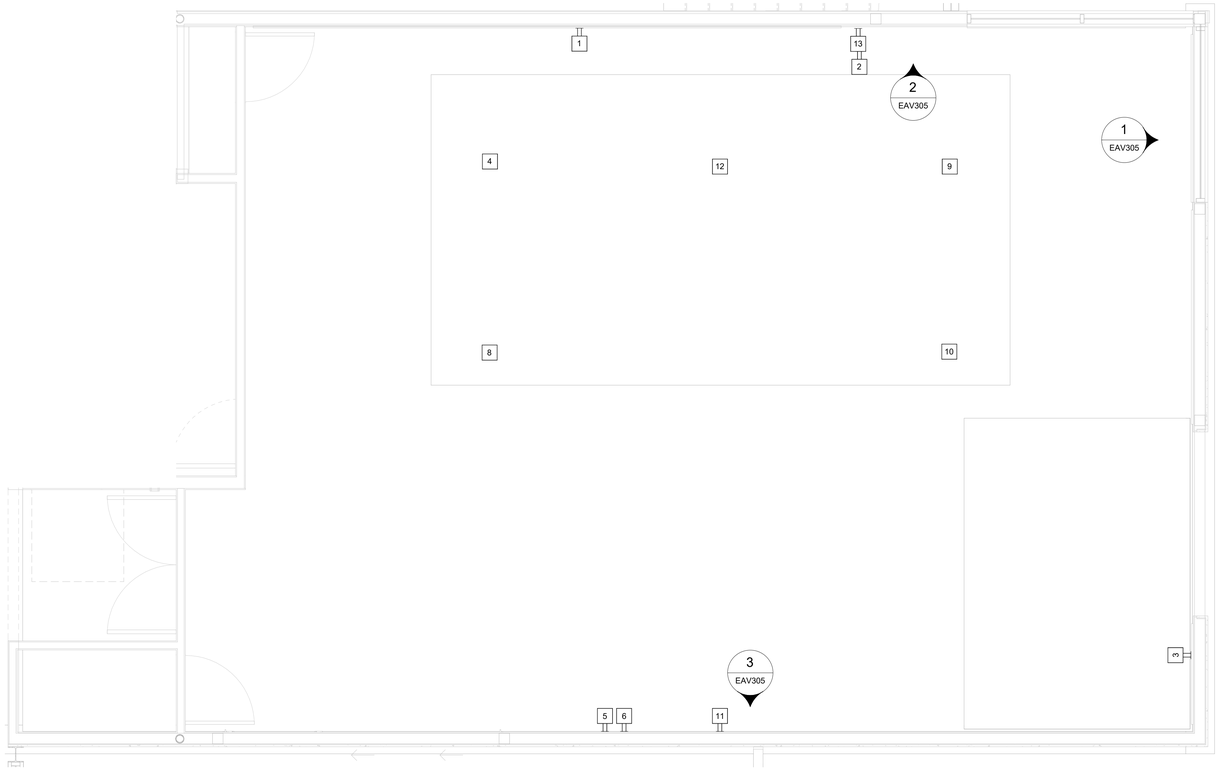
SHEET TITLE:

GAMING ROOM ENLARGED PLANS

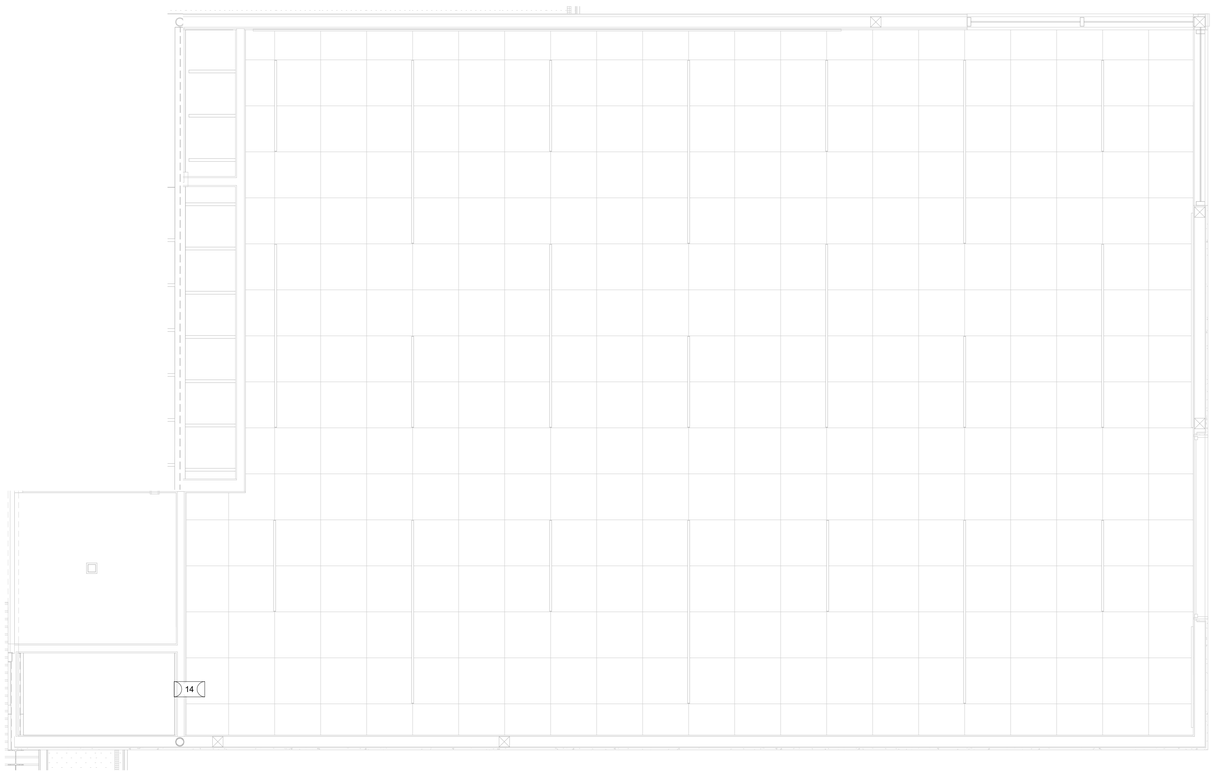
SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV204



1 COMMUNITY ROOM ENLARGED PLAN
3/8" = 1'-0"



2 COMMUNITY ROOM ENLARGED RCP
3/8" = 1'-0"

5 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV205
ENLARGED RCP	2	EAV205
ELEVATION	1	EAV305
ELEVATION	2	EAV305
ELEVATION	3	EAV305

5 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	87"	RACO	985	ONE 1" STUB	
2	87"	RACO	985	ONE 1" STUB	
3	18"	RACO	985	ONE 1" STUB	
4	0"	LEGRAND	8ATC	ONE 1" STUB	
5	92"	RACO	985	ONE 1" STUB	
6	92"	RACO	985	ONE 1" STUB	
7	28"		TROUGH	THREE 1" STUB	
8	0"	LEGRAND	8ATC		
9	0"	LEGRAND	8ATC	ONE 1" STUB	
10	0"	LEGRAND	8ATC	ONE 1" STUB	
11	79"	RPVISUALS INC	RPWM-32-BOX-WSS	ONE 1" STUB	
12	0"	LEGRAND	8ATC	ONE 1" STUB	
13	45"	RACO	985	ONE 1" STUB	
14	176"	N/A	PASS-THRU STUB	THREE 1" STUB	

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

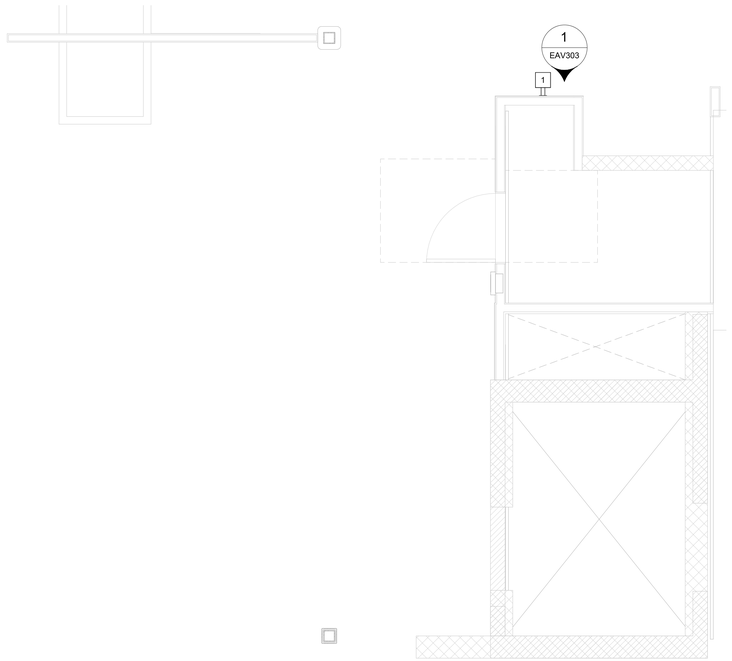
COMMUNITY ROOM ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV205

8/14/2025 9:53:20 AM



1 DIGITAL SIGNAGE LAYOUT A ENLARGED PLAN
3/8" = 1'-0"

3 - EAV		
TYPE	DETAIL	SHEET

KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV203
ELEVATION	1	EAV303

3 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	61"	FSR INC	PWB-FR-450 WHT		

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:21 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

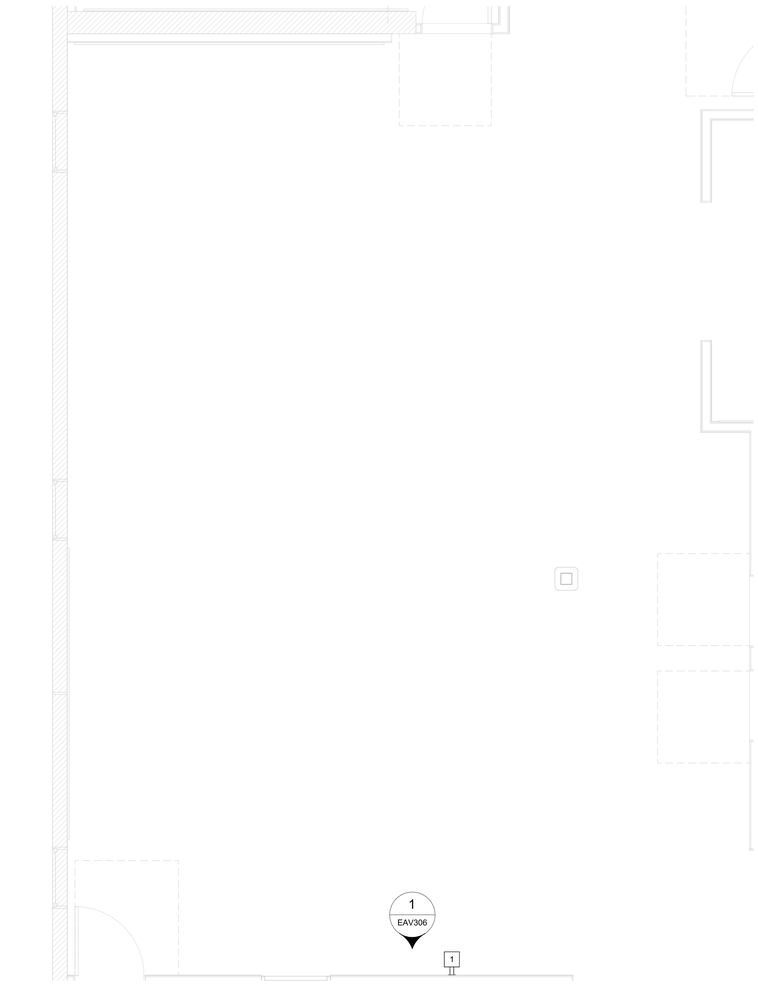
PROJECT NO. 2111010
DATE: 08/15/2025
SHEET TITLE:

DIGITAL SIGNAGE ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV203



1 OPEN WORK AREA ENLARGED PLAN
3/8" = 1'-0"

6 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV206
ELEVATION	1	EAV306

6 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	56"	FSR INC	PWB-FR-450 WHT		

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

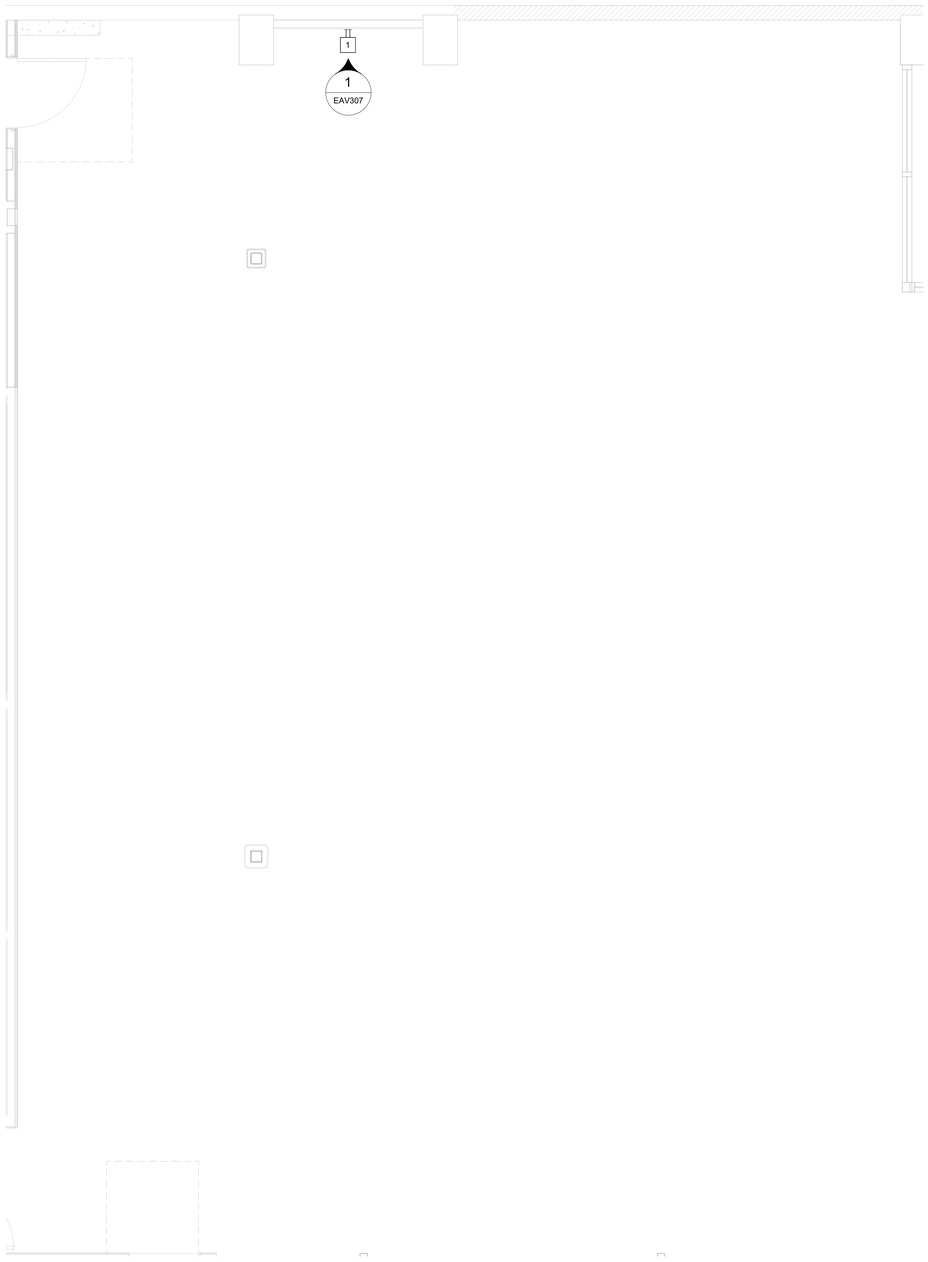
OPEN WORK AREA ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV206

8/14/2025 9:53:22 AM



1 DIGITAL SIGNAGE 2 ENLARGED PLAN
3/8" = 1'-0"

7 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV207
ELEVATION	1	EAV307

7 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	57"	FSR INC	PWB-FR-450 WHT		

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:22 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

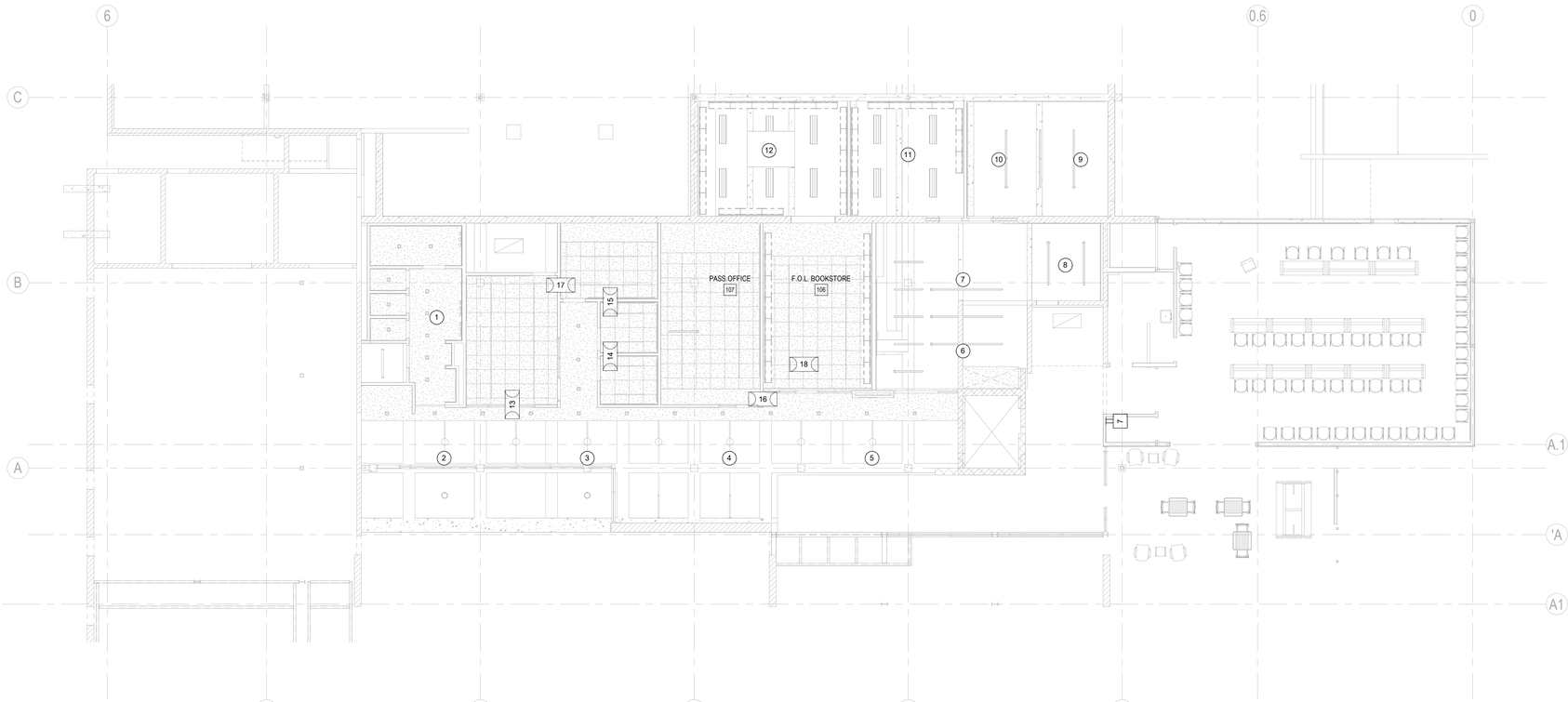
SHEET TITLE:

DIGITAL SIGNAGE 2 ENLARGED PLANS

SCALE: 3/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV207



8 - AV INFRASTRUCTURE

ID	AFF (1)	MAKE	MODEL	RACEWAYS	DESTINATION
1	96"	AtlasIED	FA97-8	ONE 3/4" TO ROOM	STORAGE 220
2	131 1/2"	RACO	689	ONE 3/4" TO BOX	3
3	131 1/2"	RACO	689	ONE 3/4" TO BOX	4
4	131 1/2"	RACO	689	ONE 3/4" TO BOX	5
5	131 1/2"	RACO	689	ONE 3/4" TO BOX	6
6	131 1/2"	RACO	689	ONE 3/4" TO BOX	7
7	131 1/2"	RACO	689	ONE 3/4" TO BOX	8
8	131 1/2"	RACO	689	ONE 3/4" TO BOX	9
9	131 1/2"	RACO	689	ONE 3/4" TO BOX	10
10	131 1/2"	RACO	689	ONE 3/4" TO BOX	STORAGE 220
11	131 1/2"	RACO	689	ONE 3/4" TO BOX	12
12	131 1/2"	RACO	689	ONE 1" STUB	PASS OFFICE 107
13	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
14	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	STUB
15	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	STUB
16	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
17	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	STUB

8 - AV INFRASTRUCTURE

ID	AFF (1)	MAKE	MODEL	RACEWAYS	DESTINATION
18	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
19	102"	N/A	PASS-THRU STUB	ONE 1" TO IDF	STORAGE 220
20	160"	N/A	PASS-THRU STUB	ONE 3/4" TO ROOM	STORAGE 220
21	102"	N/A	PASS-THRU STUB	ONE 3/4" TO ROOM	CHILDREN'S 303
22	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
23	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX	24
24	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX	25
25	96"	AtlasIED	FA97-8	ONE 3/4" STUB	ADULTS 304
26	96"	AtlasIED	FA97-8	ONE 3/4" STUB	ADULTS 304
27	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX ONE 3/4" TO BOX	28
28	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX	30
29	96"	AtlasIED	FA97-8	ONE 3/4" TO IDF ONE 3/4" TO BOX	STORAGE 220
30	96"	AtlasIED	FA97-8	ONE 3/4" STUB	CHILDREN'S 303
31	96"	AtlasIED	FA97-8	ONE 3/4" STUB	GAMING ROOM 306

8 - AV INFRASTRUCTURE

ID	AFF (1)	MAKE	MODEL	RACEWAYS	DESTINATION
32	102"	N/A	PASS-THRU STUB	ONE 3/4" TO ROOM	STORAGE 220
33	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	OPEN WORK AREA 315
34	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	OPEN WORK AREA 315
35	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	OPEN WORK AREA 315

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

SHEET TITLE:

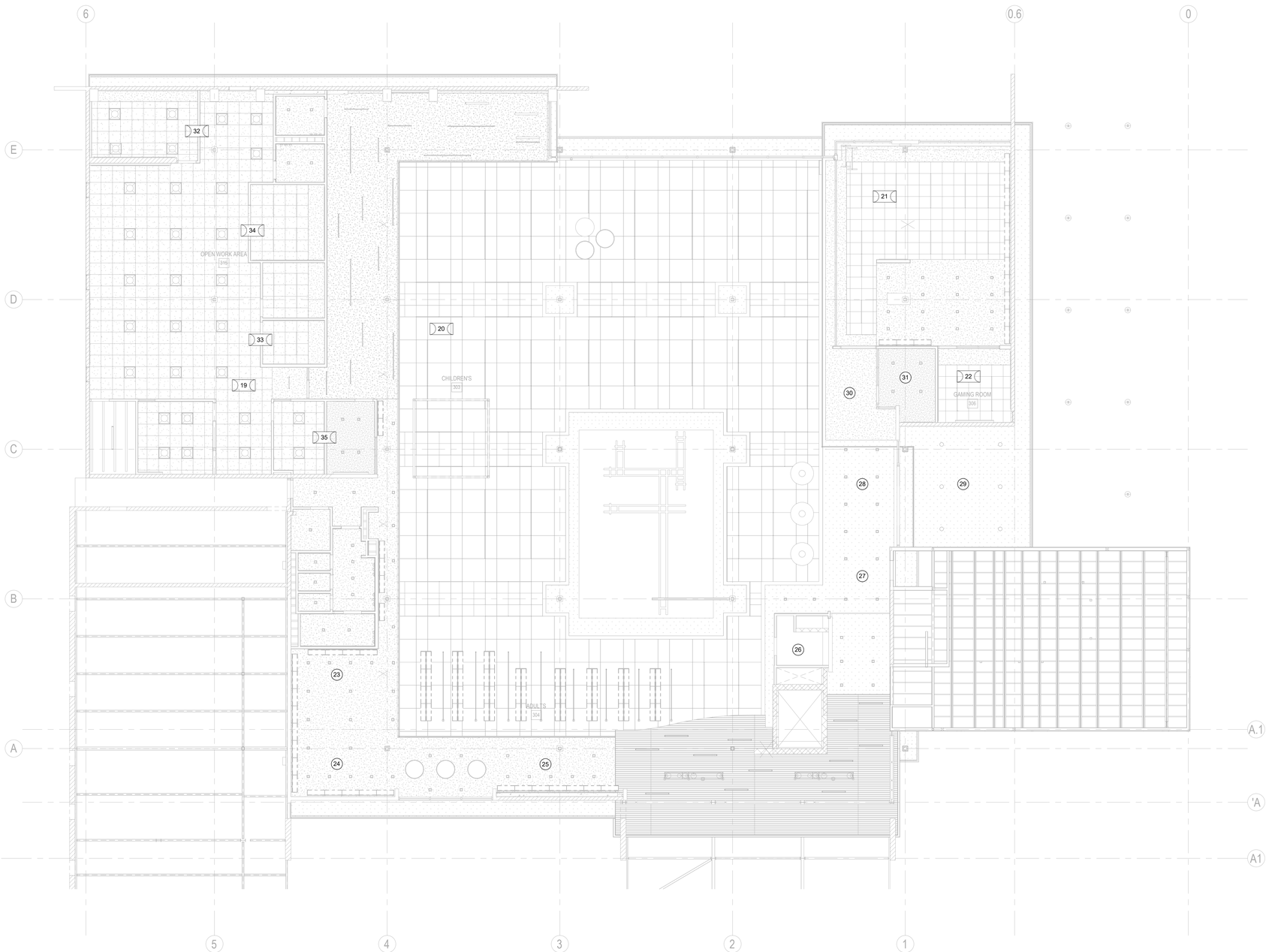
LOWER LEVEL - EAV PAGING PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV101P

8/14/2025 9:53:23 AM



8 - AV INFRASTRUCTURE					
ID	AFF (1)	MAKE	MODEL	RACEWAYS	DESTINATION
1	96"	AtlasIED	FA97-8	ONE 3/4" TO ROOM	STORAGE 220
2	131 1/2"	RACO	689	ONE 3/4" TO BOX	3
3	131 1/2"	RACO	689	ONE 3/4" TO BOX	4
4	131 1/2"	RACO	689	ONE 3/4" TO BOX	5
5	131 1/2"	RACO	689	ONE 3/4" TO BOX	6
6	131 1/2"	RACO	689	ONE 3/4" TO BOX	7
7	131 1/2"	RACO	689	ONE 3/4" TO BOX	8
8	131 1/2"	RACO	689	ONE 3/4" TO BOX	9
9	131 1/2"	RACO	689	ONE 3/4" TO BOX	10
10	131 1/2"	RACO	689	ONE 3/4" TO BOX	STORAGE 220
11	131 1/2"	RACO	689	ONE 3/4" TO BOX	12
12	131 1/2"	RACO	689	ONE 1" STUB	PASS OFFICE 107
13	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
14	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	STUB
15	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	STUB
16	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
17	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	STUB

8 - AV INFRASTRUCTURE					
ID	AFF (1)	MAKE	MODEL	RACEWAYS	DESTINATION
18	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
19	102"	N/A	PASS-THRU STUB	ONE 1" TO IDF	STORAGE 220
20	160"	N/A	PASS-THRU STUB	ONE 3/4" TO ROOM	STORAGE 220
21	102"	N/A	PASS-THRU STUB	ONE 3/4" TO ROOM	CHILDREN'S 303
22	102"	N/A	PASS-THRU STUB	ONE 3/4" TO IDF	STORAGE 220
23	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX	24
24	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX	25
25	96"	AtlasIED	FA97-8	ONE 3/4" STUB	ADULTS 304
26	96"	AtlasIED	FA97-8	ONE 3/4" STUB	ADULTS 304
27	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX ONE 3/4" TO BOX	28
28	96"	AtlasIED	FA97-8	ONE 3/4" TO BOX	30
29	96"	AtlasIED	FA97-8	ONE 3/4" TO IDF ONE 3/4" TO BOX	STORAGE 220
30	96"	AtlasIED	FA97-8	ONE 3/4" STUB	CHILDREN'S 303
31	96"	AtlasIED	FA97-8	ONE 3/4" STUB	GAMING ROOM 306

8 - AV INFRASTRUCTURE					
ID	AFF (1)	MAKE	MODEL	RACEWAYS	DESTINATION
32	102"	N/A	PASS-THRU STUB	ONE 3/4" TO ROOM	STORAGE 220
33	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	OPEN WORK AREA 315
34	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	OPEN WORK AREA 315
35	102"	N/A	PASS-THRU STUB	ONE 3/4" STUB	OPEN WORK AREA 315

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expiration Date:
2028/03/31

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

SHEET TITLE:

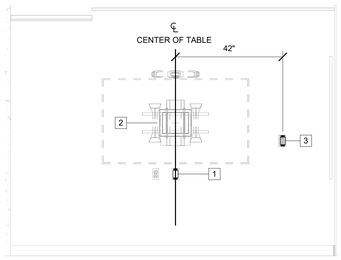
MAIN LEVEL - EAV PAGING PLAN

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV102P

8/14/2025 9:53:26 AM



1 TELE MEETING ROOM ELEVATION
1/2" = 1'-0"

1 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV100
ENLARGED PLAN	1	EAV201
ELEVATION	1	EAV301

1 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	32"	RACO	689	ONE 1 1/4" TO BOX	2
2	52"	FSR INC	PWB-FR-450 WHT		
3	45"	RACO	689	ONE 1" TO BOX	2

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:26 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

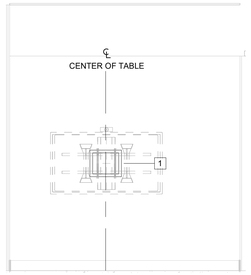
SHEET TITLE:

TELE MEETING ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV301



1 STAFF MEETING ROOM - EAST
1/2" = 1'-0"

2 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV202
ELEVATION	1	EAV302

2 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	42"	FSR INC	PWB-FR-450 WHT		
2	0"	LEGRAND	8ATC	ONE 1" TO BOX	1

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:27 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

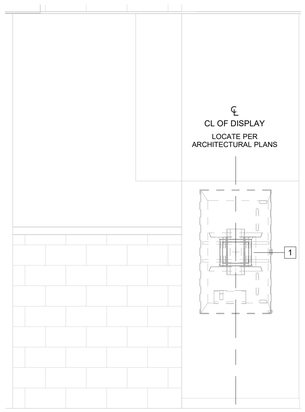
SHEET TITLE:

STAFF MEETING ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV302



1 DIGITAL SIGNAGE - SOUTH 2
NTS

3 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV203
ELEVATION	1	EAV303

3 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	61"	FSR INC	PWB-FR-450 WHT		

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

8/14/2025 9:53:28 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
2023/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

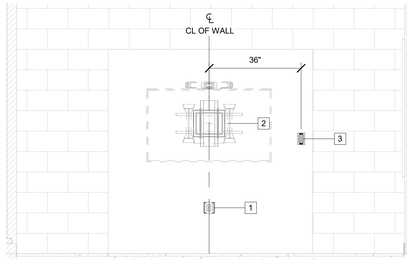
SHEET TITLE:

DIGITAL SIGNAGE SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV303



1 GAMING ROOM - SOUTH
1/2" = 1'-0"

4 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV204
ELEVATION	1	EAV304

4 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	18"	RACO	985	ONE 1 1/4" TO BOX	2
2	51"	FSR INC	PWB-FR-450 WHT		
3	45"	RACO	689	ONE 1" TO BOX	2

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

SHEET TITLE:

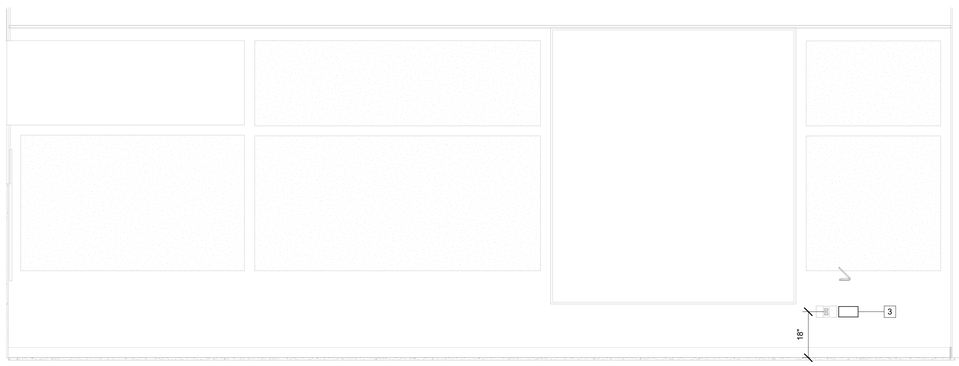
GAMING ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

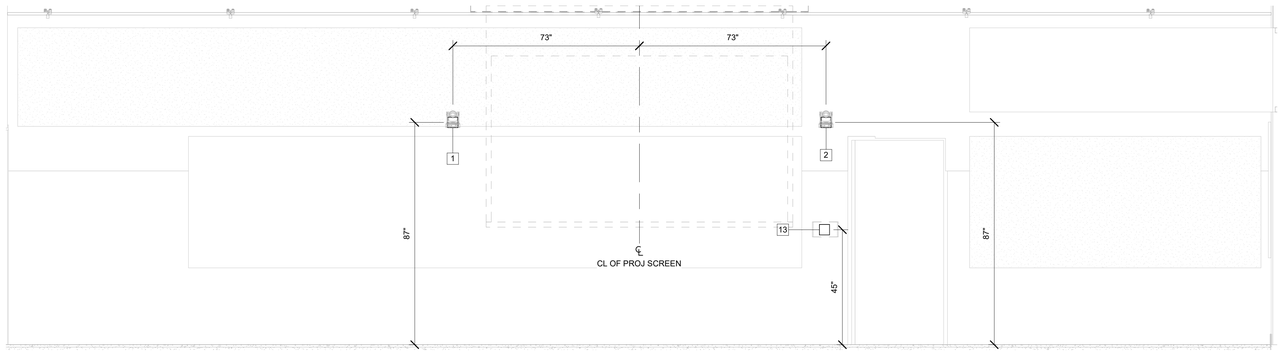
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV304

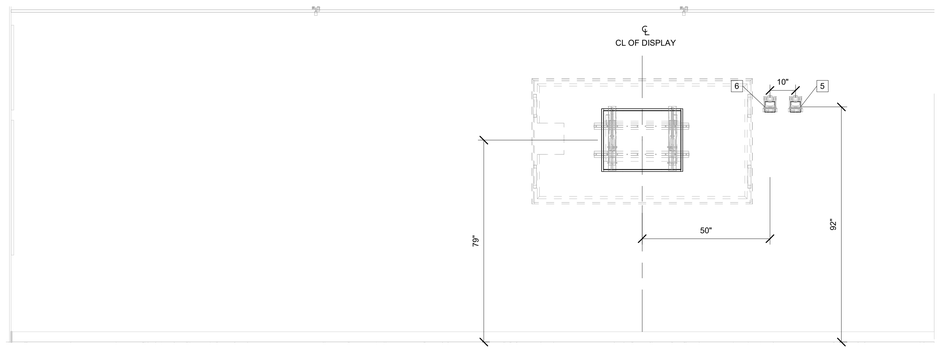
8/14/2025 9:53:28 AM



1 COMMUNITY ROOM - EAST
1/2" = 1'-0"



2 COMMUNITY ROOM - NORTH
1/2" = 1'-0"



3 COMMUNITY ROOM - SOUTH
1/2" = 1'-0"

5 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV205
ENLARGED RCP	2	EAV205
ELEVATION	1	EAV305
ELEVATION	2	EAV305
ELEVATION	3	EAV305

5 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	87"	RACO	985	ONE 1" STUB	
2	87"	RACO	985	ONE 1" STUB	
3	18"	RACO	985	ONE 1" STUB	
4	0"	LEGRAND	8ATC	ONE 1" STUB	
5	92"	RACO	985	ONE 1" STUB	
6	92"	RACO	985	ONE 1" STUB	
7	28"		TROUGH	THREE 1" STUB	
8	0"	LEGRAND	8ATC		
9	0"	LEGRAND	8ATC	ONE 1" STUB	
10	0"	LEGRAND	8ATC	ONE 1" STUB	
11	79"	RPVISUALS INC	RPWM-32-BOX-WSS	ONE 1" STUB	
12	0"	LEGRAND	8ATC	ONE 1" STUB	
13	45"	RACO	985	ONE 1" STUB	
14	176"	N/A	PASS-THRU STUB	THREE 1" STUB	

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
627545
Exp. Date
2026/03/31

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

SHEET TITLE:

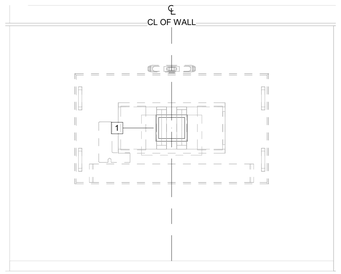
COMMUNITY ROOM SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV305

8/14/2025 9:53:30 AM



1 OPEN WORK AREA - SOUTH 3
1/2" = 1'-0"

6 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV206
ELEVATION	1	EAV306

6 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	56"	FSR INC	PWB-FR-450 WHT		

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2028/03/31
AVIXA

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025

SHEET TITLE:

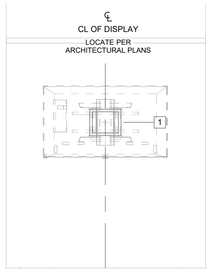
OPEN WORK AREA SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV306

8/14/2025 9:53:31 AM



1 DIGITAL SIGNAGE 2 ELEVATION
1/2" = 1'-0"

7 - EAV		
TYPE	DETAIL	SHEET
KEY PLAN	1	EAV102
ENLARGED PLAN	1	EAV207
ELEVATION	1	EAV307

7 - AV INFRASTRUCTURE					
ID	AFF	MAKE	MODEL	RACEWAYS	DESTINATION
1	57"	FSR INC	PWB-FR-450 WHT		

SEE EAV000 FOR PROJECT NOTES AND DEFINITIONS.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
Certified Technology Specialist-Design
CTS-D
Scott Avery
Expires
2025/03/31
AVIXA

NO.	DATE	REVISIONS
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

DIGITAL SIGNAGE 2 SECTIONS AND ELEVATIONS

SCALE: 1/2" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

EAV307

8/14/2025 9:53:31 AM

TELECOMMUNICATION SHEET SET

SHEET NUMBER	SHEET TITLE
0 - LEGEND	
T000	TELECOM SYMBOLS AND NOTES
T001	TELECOM STANDARDS (1 OF 2)
T002	TELECOM STANDARDS (2 OF 2)
10 - KEY PLANS	
T100	TELECOM SITE PLAN
T101	TELECOM LOWER LEVEL FLOOR PLAN
T102	TELECOM MAIN LEVEL FLOOR PLAN
T102A	TELECOM MAIN LEVEL FLOOR PLAN - ADD ALTS
20 - ENLARGEMENTS	
T201	TELECOM ENLARGED PLANS
30 - RACK ELEVATIONS	
T301	TELECOM RACK ELEVATIONS

SEPARATION DISTANCE BETWEEN POWER CABLES AND DATA CABLES

CONDITION	MINIMUM SEPARATION DISTANCE		
	< 2 kVA	2-5 kVA	> 5kVA
UNSHIELDED POWER LINES OR ELECTRICAL EQUIPMENT IN PROXIMITY TO OPEN OR NONMETAL PATHWAYS.	5"	12"	24"
UNSHIELDED POWER LINES OR ELECTRICAL EQUIPMENT IN PROXIMITY TO A GROUNDED METAL CONDUIT PATHWAY.	2.5"	6"	12"
POWER LINES ENCLOSED IN A GROUNDED METAL CONDUIT (OR EQUIVALENT SHIELDING) IN PROXIMITY TO A GROUNDED METAL CONDUIT PATHWAY.		3"	6"
ELECTRICAL MOTORS AND TRANSFORMERS.			48"

SEPARATION DISTANCE BETWEEN DATA CABLES AND SPECIFIC EMI SOURCES

SOURCE OF DISTURBANCE	MINIMUM SEPARATION DISTANCE
FLUORESCENT LAMPS	5"
NEON LAMPS	5"
MERCURY VAPOUR LAMPS	5"
HIGH-INTENSITY DISCHARGE LAMPS	5"
ARC WELDERS	31"
FREQUENCY INDUCTION HEATING	39"

50' DISTANCE LIMIT RULE

A. IN NO CASE MUST A NON-LISTED OUTSIDE PLANT OR INCOMING SERVICE OUTDOOR RATED CABLE EXCEED 50 FEET FROM THE POINT OF ENTRANCE INTO ANY BUILDING. IF ON-SITE CONDITIONS RESULT IN A CASE WHERE THE CABLE EXCEEDS THE DISTANCE LIMIT THE CONTRACTOR MUST ADVISE A SOLUTION WITH THE PROJECT CONSULTANT. IN ALL CASES THE SOLUTION WOULD NEED TO INVOLVE EITHER TRANSITIONING FROM OUTDOOR NON-LISTED TO INDOOR LISTED CABLE VIA A SPLICE POINT (E.G. SPLICE CASE OR SPLICE ENCLOSURE FOR FIBER, PROTECTOR BLOCK FOR COPPER ETC.) OR THE ALTERNATIVE SHOULD BE TO ENCLOSE THE OUTDOOR RATED CABLE WITHIN INTERMEDIATE METAL CONDUIT (IMC) OR RIGID METAL CONDUIT (RMC) THAT IS PROPERLY SEALED AND BONDED TO A GROUNDING ELECTRODE. RETAINING THE OUTDOOR CABLE WITHIN CONDUIT SHOULD EFFECTIVELY EXTEND THE POINT OF ENTRANCE INTO THE BUILDING.

OSP DETECTION TAPE INCLUSION

A. IN ORDER TO REDUCE THE CHANCE OF ACCIDENTAL DIG-UP OF OUTSIDE PLANT DUCTBANK ELEMENTS IN THE FUTURE, PROVIDE A DETECTABLE WARNING TAPE CONTAINING METALLIC TRACINGS ALONG THE DUCTBANK PATH AT 12" BELOW GRADE MINIMUM. COLOR OF THE DETECTABLE TAPE SHALL BE ORANGE OR WHICHEVER COLOR THE COMMON GROUND ALLIANCE (CGA) HAS CURRENTLY DETERMINED FOR TELEVISION AND COMMUNITY ANTENNA TELEVISION (CATV) CABLES.

TELECOMMUNICATION SYMBOLS

SYMBOL	DESCRIPTION
$\triangleleft_{E}$	ELEVATOR PHONE OUTLET - PROVIDE ONE ANALOG VOICE DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. ROUTE ONE 1" CONDUIT FROM ELEVATOR EQUIPMENT BOX TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. COORDINATE EXACT LOCATION WITH ELEVATOR VENDOR.
$\triangleleft_{W}$	WALL PHONE OUTLET - PROVIDE ONE DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. MOUNT AT 48" AFF UNLESS NOTED OTHERWISE.
$\triangleleft_{4D}$	WALL STANDARD COMMUNICATION OUTLET - PROVIDE FOUR DATA DROPS COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. STUB ONE 1.25" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. MOUNT AT PROJECT'S STANDARD RECEPTACLE HEIGHT UNLESS NOTED OTHERWISE.
$\square_{4D}$	FLOOR STANDARD COMMUNICATION OUTLET - PROVIDE FOUR DATA DROPS COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. STUB ONE 1.25" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. MOUNT IN ELECTRICAL FLOOR BOX UNLESS NOTED OTHERWISE. EXACT LOCATION TO BE COORDINATED BY ARCHITECT.
$\bigcirc_{WAP}$	WIRELESS COMMUNICATION OUTLET - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. WIRELESS ACCESS POINT DEVICE IS OWNER FURNISHED CONTRACTOR INSTALLED.
$\triangleleft_{WAP}$	WALL WIRELESS COMMUNICATION OUTLET - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. MOUNT AT 120" AFF UNLESS NOTED OTHERWISE. WIRELESS ACCESS POINT DEVICE IS OWNER FURNISHED CONTRACTOR INSTALLED.
$\triangleleft_{XD}$	WALL DATA COMMUNICATION OUTLET - PROVIDE QUANTITY OF DROPS AS INDICATED BY SUBSCRIPT COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. STUB ONE 1.25" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. MOUNT AT PROJECT'S STANDARD RECEPTACLE HEIGHT UNLESS NOTED OTHERWISE.
$\square_{XD}$	FLOOR DATA COMMUNICATION OUTLET - PROVIDE QUANTITY OF DROPS AS INDICATED BY SUBSCRIPT COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. STUB ONE 1.25" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. MOUNT IN ELECTRICAL FLOOR BOX UNLESS NOTED OTHERWISE. EXACT LOCATION TO BE COORDINATED BY ARCHITECT.
$\triangleleft_{XFP}$	DATA COMMUNICATION OUTLET FOR FLAT PANEL - PROVIDE QUANTITY OF DROPS AS INDICATED BY SUBSCRIPT COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. MOUNTED IN FLAT PANEL IN-WALL BACKBOX. SEE EAV DRAWINGS FOR INFORMATION OF THE FLAT PANEL IN-WALL BACKBOX. STUB ONE 1.25" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE.
$\bigcirc_{XFP}$	CEILING DATA COMMUNICATION OUTLET FOR FLAT PANEL DISPLAY- PROVIDE QUANTITY OF DROPS AS INDICATED BY SUBSCRIPT COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. STUB ONE 1.25" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE.
$\triangleleft_{CP}$	DATA FOR AV ROOM CONTROL PANEL - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. NO FACEPLATE. STUB ONE 1" CONDUIT FROM AV BACKBOX TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. SEE EAV DRAWINGS FOR INFORMATION OF THE AV BACKBOX.
$\triangleleft_{RS}$	DATA FOR AV ROOM SCHEDULING PANEL - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. NO FACEPLATE. STUB ONE 1" CONDUIT FROM AV BACKBOX TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. SEE EAV DRAWINGS FOR INFORMATION OF THE AV BACKBOX.
$\triangleleft_{F}$	SYSTEM FURNITURE STANDARD COMMUNICATION OUTLET - PROVIDE FOUR DATA DROPS COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. COORDINATE WITH THE ARCHITECT AND FURNITURE CONSULTANT FOR MOUNTING HEIGHT.
$\bigcirc_{P}$	CEILING DATA COMMUNICATION OUTLET FOR PROJECTOR - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE.
$\triangleleft_{CAP}$	WALL DATA FOR CARD ACCESS PANEL - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. COORDINATE EXACT LOCATION WITH OWNER.
$\triangleleft_{AVC}$	DATA FOR AV CAMERA - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. NO FACEPLATE. STUB ONE 1" CONDUIT FROM AV BACKBOX TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. SEE EAV DRAWINGS FOR INFORMATION OF THE AV BACKBOX.
$\bigcirc_{XD}$	CEILING DATA COMMUNICATION OUTLET - PROVIDE QUANTITY OF DROPS AS INDICATED BY SUBSCRIPT COMPLETE WITH CAT6A CABLES, CONNECTORS AND TERMINATIONS AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE.
$\bigcirc_{CAM}$	CEILING DATA FOR SECURITY CAMERA - PROVIDE ONE DATA DROP COMPLETE WITH CAT6A CABLE, CONNECTOR AND TERMINATION AS REQUIRED. STUB ONE 1" CONDUIT FROM 5 SQUARE TELECOMMUNICATION OUTLET BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN. COORDINATE EXACT LOCATION WITH OWNER.
PT1	FURNITURE FEED POKE-THRU DEVICE. WIREMOLD 4FFATC SERIES WITH FURNITURE FEED COVER. PROVIDE ONE 1.5" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. EXACT LOCATION TO BE COORDINATED BY ARCHITECT.
PT2	FURNITURE FEED POKE-THRU DEVICE. WIREMOLD RC9AM2TC SERIES WITH FURNITURE FEED COVER. PROVIDE ONE 2" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. EXACT LOCATION TO BE COORDINATED BY ARCHITECT.
J1	5"x5"x4" JUNCTION BOX. PROVIDE ONE 1.5" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. MOUNT AT PROJECT'S STANDARD RECEPTACLE HEIGHT UNLESS NOTED OTHERWISE.
J2	6"x6"x4" JUNCTION BOX. PROVIDE ONE 2" CONDUIT TO ACCESSIBLE CEILING ON THE SAME FLOOR AS SHOWN UNLESS NOTED OTHERWISE. MOUNT AT PROJECT'S STANDARD RECEPTACLE HEIGHT UNLESS NOTED OTHERWISE.
	19" TELECOMMUNICATIONS RACK.
	TELECOMMUNICATIONS GROUND BUS BAR.
	FIRE RETARDANT .75" PLYWOOD BACKBOARD. PAINTED WITH TWO COATS OF WHITE FIRE RETARDANT PAINT PRIOR TO INSTALLATION. EACH SHEET OF PLYWOOD BACKBOARD SHALL BE 4' WIDE X 8' HIGH.
	TELECOMMUNICATIONS BASKET CABLE TRAY, 12" WIDE x 4" DEEP, UNO. MOUNT ABOVE ACCESSIBLE CEILING. COORDINATE LOCATION WITH DUCTWORK, PLUMBING, FIRE PROTECTION, ELECTRICAL, AND LIGHT FIXTURES.
	TELECOMMUNICATIONS LADDER CABLE RUNWAY. SIZE AS INDICATED ON DRAWINGS.
	EMT CONDUIT CONCEALED IN SLAB OR UNDER FINISHED FLOOR. ROUTE AS INDICATED.
	EMT CONDUIT CONCEALED IN WALL OR ABOVE FINISHED CEILING. ROUTE AS INDICATED.
	EMT CONDUIT STUB UP INTO ACCESSIBLE CEILING UNLESS NOTED OTHERWISE.
	CONDUIT ABOVE CEILING UNLESS NOTED OTHERWISE. CONDUIT SHALL BE CONCEALED.

AFF	ABOVE FINISHED FLOOR
BFC	BELOW FINISHED CEILING
UNO	UNLESS NOTED OTHERWISE
TR	TELECOMMUNICATION ROOM
ER	EQUIPMENT ROOM
TGB	TELECOMMUNICATION GROUNDING BUSBAR
TMGB	TELECOMMUNICATION MAIN GROUNDING BUSBAR
TBB	TELECOMMUNICATION BONDING BACKBONE

CONDUIT INSTALLATION NOTES

THE RACEWAY SYSTEM FOR TELECOM CABLE SHALL FOLLOW THE NEC AND ALL LOCAL CODES GOVERNING THIS PROJECT. ADDITIONAL REQUIREMENTS ARE AS FOLLOWS:

1. A PULL CORD (NYLON, 1/8" MINIMUM) SHALL BE INSTALLED WITHIN ALL CONDUITS.
2. A PULL ROPE (NYLON/POLYESTER, 3/8" MINIMUM) SHALL BE INSTALLED WITHIN ALL OUTSIDE PLANT CONDUITS. MINIMUM TENSILE STRENGTH OF ROPE SHALL BE 2000 LBS PER FOOT.
3. PULL CORD AND PULL ROPE WITHIN ALL CONDUITS SHALL BE RE-PULLED AFTER EACH USE. CONDUITS SHALL NOT REMAIN EMPTY.
4. CONDUIT SHALL RUN IN MOST DIRECT ROUTE POSSIBLE, USUALLY PARALLEL WITH BUILDING LINES.
5. CONDUIT SLEEVES SHOULD BE RIGID GALVANIZED STEEL FOR PENETRATIONS OF CONCRETE SLABS, CONCRETE WALLS. ALL SLEEVES SHALL BE RIGIDLY INSTALLED USING APPROPRIATE FITTINGS AND ALL PENETRATIONS SHALL BE GROUTED AROUND THE SLEEVE. SLEEVES SHALL PROJECT A MINIMUM OF 4" BEYOND WALL OR FLOOR SURFACE. ALL PENETRATIONS SHALL BE FIRESTOPPED.
6. CONDUIT RUN SHALL CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 100 FEET. IF RUNS TOTAL MORE THAN 100 FEET, PULL POINTS OR PULL BOXES SHALL BE INSERTED.
7. CONDUIT RUNS TO WORK AREAS SHALL SERVE NO MORE THAN ONE COMMUNICATION OUTLET. DAISY CHAINING IS NEVER ALLOWED.
8. CONDUIT SHALL HAVE NO MORE THAN TWO 90 DEGREES OF BENDS AT ANY POINT OR MORE THAN 180 DEGREES OF CUMULATIVE BENDS BETWEEN PULL POINTS.
9. INSTALL CONDUITS WITH A MINIMUM OF BENDS AND OFFSETS. BENDS SHALL NOT KINK OR DESTROY INTERIOR CROSS SECTION OF RACEWAY. FACTORY MADE BENDS SHALL BE USED FOR RACEWAY'S 1" TRADE SIZE AND LARGER. BENDS RADIUS SHALL BE 6 TIMES INTERNAL DIAMETER FOR CONDUIT SIZES UP TO 2". A CONDUIT GREATER THAN 2" SHALL HAVE BEND RADIUS AT LEAST 10 TIMES DIAMETER OF CONDUIT. DO NOT USE PULL BOX IN LIEU OF A BEND RADIUS. BEND RADIUS ON CABLING SHOULD ALWAYS BE MADE WITHIN THE CONDUIT.
10. DO NOT INSTALL CONDUIT OVER OR ADJACENT TO BOILERS, INCINERATORS, HOT WATER LINES, OR STEAM LINES.
11. REAM ALL CONDUIT ENDS AND FIT THEM WITH AN INSULATED BUSHING TO ELIMINATE SHARP EDGES THAT MAY DAMAGE CABLES.
12. AFTER INSTALLATION, LEAVE CONDUITS CLEAN, DRY AND UNOBSTRUCTED, REAMED AND FITTED WITH BUSHINGS.
13. ELECTRICAL METALLIC TUBING AND RIGID METAL CONDUIT ARE THE ONLY ALLOWED TYPES FOR INTERIOR BUILDING. FLEXIBLE METAL CONDUIT IS NEVER ALLOWED.
14. CONDUIT SYSTEM INSTALLATION:
    - 14.1 CABLE IN EXTERIOR, ABOVE GRADE LOCATIONS: RIGID GALVANIZED STEEL.
    - 14.2 INTERIOR LOCATIONS: EMT AND RMC.
    - 14.3 CABLE BELOW GRADE: SCHEDULE 40 PVC.
15. ALL METALLIC CONDUITS SHALL BE APPROPRIATELY GROUNDED AS SPECIFIED IN THE NEC, ANSI/TIA/EIA J-STD-607-B AND PER MANUFACTURER'S SPECIFICATIONS.
16. CONDUITS ARE TO BE CLEARLY MARKED AT EACH END TO INDICATE THE TRADE (E.G. AV, TELECOM) THAT THE CONDUIT IS INTENDED TO SUPPORT.
17. CABLE PATHWAY SHOULD BE LESS THAN 270 FEET. THE LENGTH SHALL BE MEASURED FROM THE OUTLET IN THE WORK AREA TO PATCH PANEL IN THE RACK.
18. FOR OUTSIDE PLANT CONDUITS ROUTES PROVIDE A SITE LEVEL ACCESSIBLE HANDHOLE EVERY (2) 90 DEGREE BENDS OR 180 DEGREES IN BENDS TOTAL. DISTANCE BETWEEN EACH HANDHOLE SHALL NOT EXCEED 600 FEET DISTANCE. DO NOT USE HANDHOLE IN LIEU OF A BEND RADIUS. BEND RADIUS ON CABLING SHOULD ALWAYS BE MADE WITHIN THE CONDUIT.
19. OUTSIDE PLANT LOCATIONS, ROUTES, AND PULL POINTS ARE INDICATIVE ONLY. CONTRACTOR TO REVIEW THE PROJECT SITE AND SUBMIT SHOP DRAWING WHICH INCLUDES BUT IS NOT LIMITED TO ROUTES, CONFIGURATION OF CONDUITS, AND DESIGN OF HANDHOLES AND MANHOLES FOR REVIEW BY THE DESIGN TEAM BEFORE COMMENCING WORK.
20. CONTRACTOR TO SUBMIT PRE-CAST HANDHOLE AND MANHOLE PRODUCTS WHICH ARE TO BE INTEGRATED INTO THE OUTSIDE PLANT COMMUNICATIONS DUCTBANK FOR REVIEW BEFORE COMMENCING WORK.
21. CONSTRACTOR SHALL PROVIDE A 2" CONDUIT SLEEVES EXTENDING INTO ACCESSIBLE CEILING AS NECESSARY INTO AREAS AND ROOMS WHERE OUTLET CONDUITS CANNOT EXTEND INTO THE ADJACENT CORRIDOR.

GENERAL PROJECT NOTES

A. ALL MOUNTING HEIGHTS ARE TO THE CENTER LINE OF THE DEVICE BACKBOX UNLESS NOTED OTHERWISE.

B. ALL BOXES AND CONDUITS IN WALLS AND CEILINGS SHALL BE FLUSH MOUNTED OR CONCEALED UNLESS NOTED OTHERWISE.

C. ALL EXTERIOR OUTLETS SHALL BE EXTERIOR RATED OUTLET, IP-67 RATED (NEMA 6).

D. EXACT LOCATION OF ALL TELECOM OUTLETS LOCATED IN FURNITURE AND MILLWORK TO BE VERIFIED WITH ARCHITECT PRIOR TO INSTALLATION.

E. ELECTRICAL OUTLETS SHALL BE PROVIDED WITHIN THREE-SIX INCHES OF COMMUNICATION OUTLETS AT EQUAL HEIGHT.

F. IT SHALL BE UNDERSTOOD ALL INFORMATION WITHIN THIS DRAWING PACKAGE IS DIAGRAMMATIC TO SHOW THE DESIGN INTENT. ANY FIELD DEVIATIONS FROM THE DRAWINGS BY THE CONTRACTOR HOWEVER, SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT OR CONSULTANT. IF FIELD DEVIATIONS ARE NOT SUBMITTED BEFOREHAND, THE INDIVIDUAL CHANGE(S) WILL BE CONSIDERED OUT OF SCOPE FROM THE ARCHITECT AND CONSULTANT'S OVERALL DESIGN AND SPECIFICATION FOR THE PROJECT.

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

TELECOM SYMBOLS AND NOTES

SCALE: 12" = 1'-0"

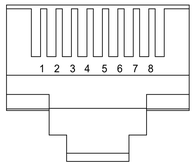
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T000

8/13/2025 10:23:02 AM

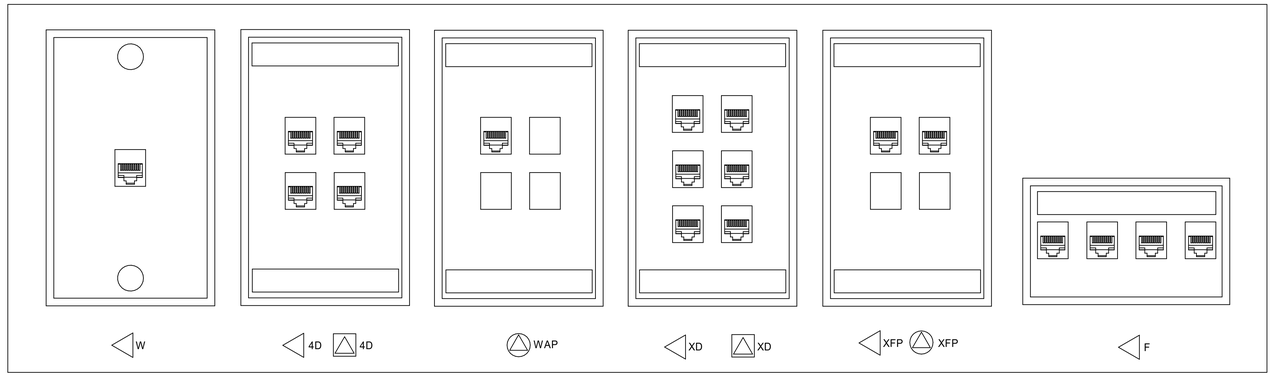
568A PIN CONFIGURATION

PIN	WIRE COLOR
1	WHITE/GREEN
2	GREEN
3	WHITE/ORANGE
4	BLUE
5	WHITE/BLUE
6	ORANGE
7	WHITE/BROWN
8	BROWN

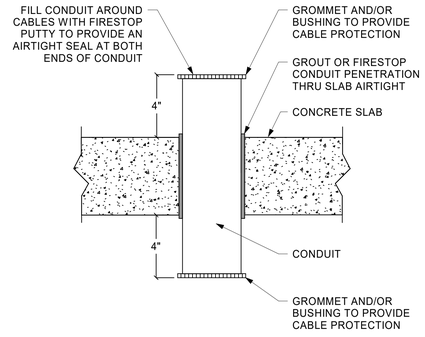


RJ45

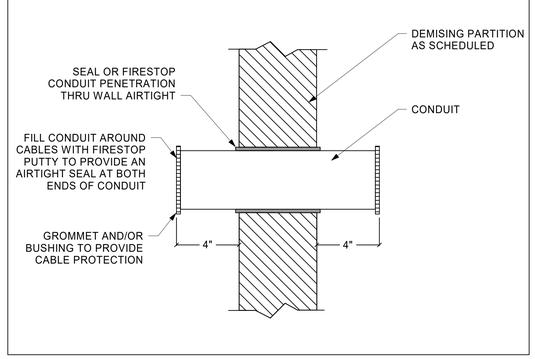
1 568A PIN OUT CONFIGURATION
NTS



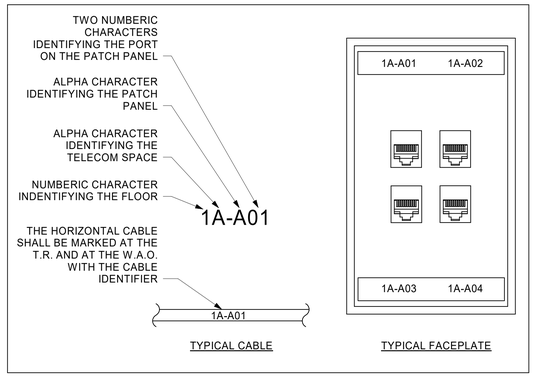
2 TYPICAL FACEPLATE
NTS



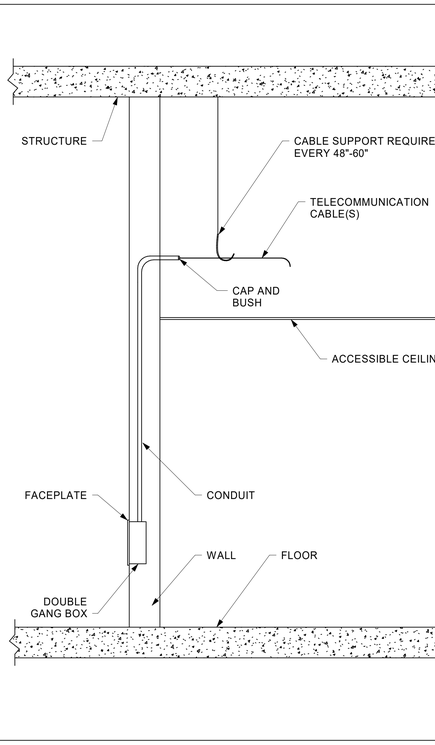
3 TYPICAL SLEEVE IN TELECOM ROOM SLAB
NTS



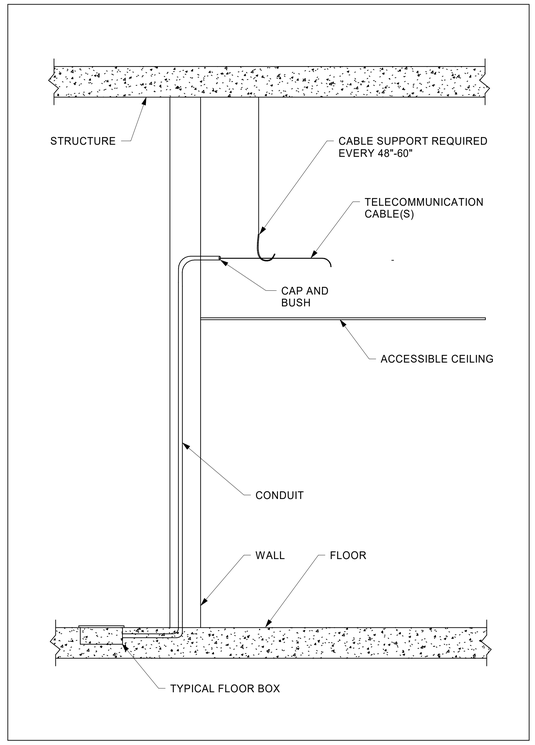
4 TYPICAL SLEEVE IN RATED WALL
NTS



5 TYPICAL LABELING SCHEME
NTS



6 TYPICAL FLUSH WALL MUNT TELECOM OUTLET
NTS



7 TYPICAL FLOOR MOUNT TELECOM OUTLET
NTS

8/13/2025 10:23:03 AM

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

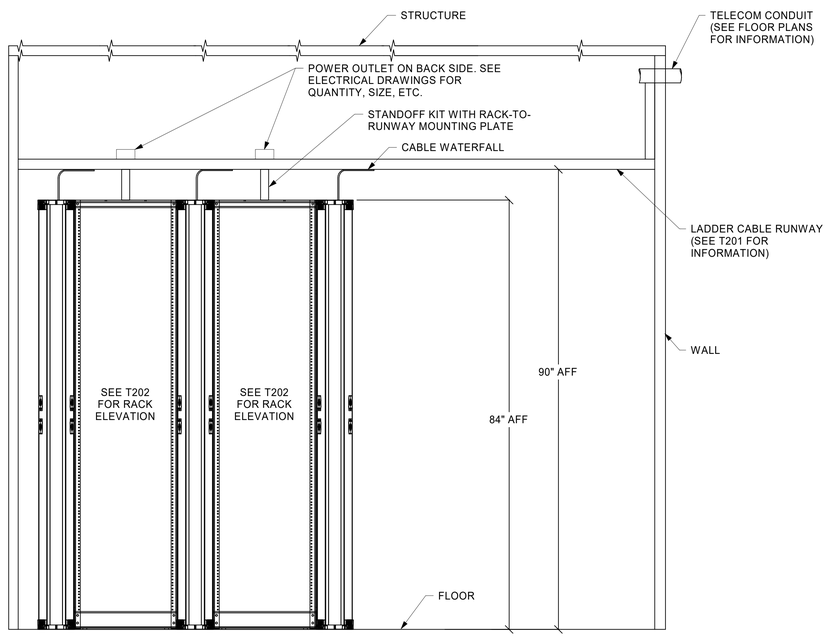
SHEET TITLE:

TELECOM STANDARDS (1 OF 2)

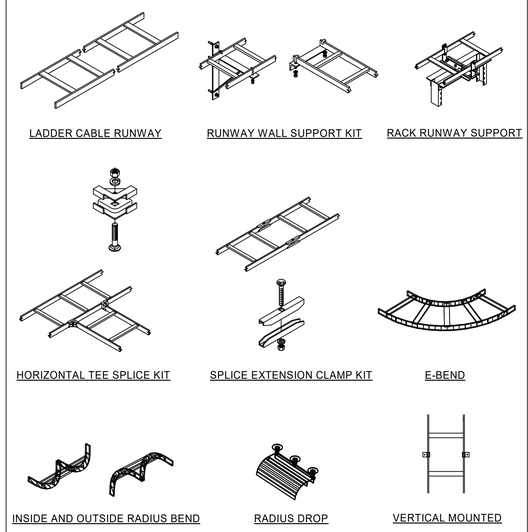
SCALE: NTS

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brule Architects and may not be duplicated without the written consent of Anderson-Brule Architects. ©

T001



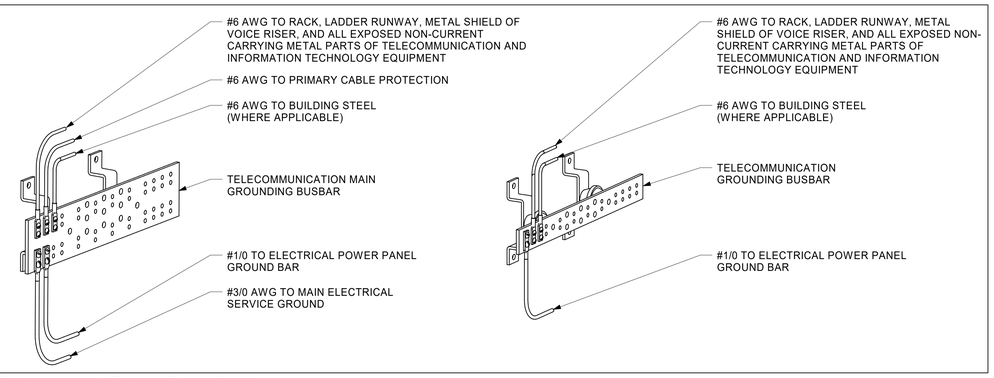
1 TYPICAL TELECOM RACK - CABLE AND RACEWAY, ELEVATION
NTS



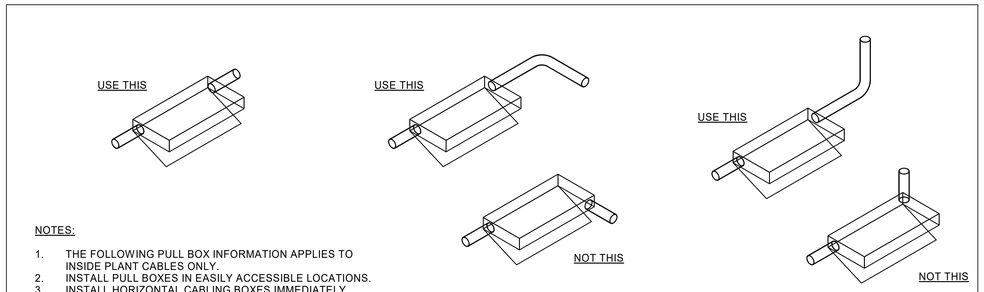
NOTES:

1. PROVIDE ALL PARTS AND PIECES TO CREATE A CONTINUOUS PATHWAY FOR CABLES WITHIN TELECOMMUNICATION ROOMS. PROVIDE PARTS TO SUPPORT CABLE CONTINUOUSLY FROM THE SLEEVES ENTERING THE TR TO THE EQUIPMENT RACKS AND BACKBOARDS.

2 TYPICAL LADDER CABLE RUNWAY AND ACCESSORIES
NTS



3 TELECOMMUNICATION GROUNDING
NTS



NOTES:

1. THE FOLLOWING PULL BOX INFORMATION APPLIES TO INSIDE PLANT CABLES ONLY.
2. INSTALL PULL BOXES IN EASILY ACCESSIBLE LOCATIONS.
3. INSTALL HORIZONTAL CABLING BOXES IMMEDIATELY ABOVE SUSPENDED CEILINGS.
4. FOR DIRECT ACCESS TO A BOX, PROVIDE A SUITABLE, MARKED, HINGED PANEL (OR EQUIVALENT) IN THE SUSPENDED CEILING. THIS ACCESS PANEL CAN ALSO SERVE AS THE COVER FOR THE BOX.

4 TYPICAL PULL BOX AND CONDUIT
NTS

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

TELECOM STANDARDS (2 OF 2)

SCALE: 1/8" = 1'-0"

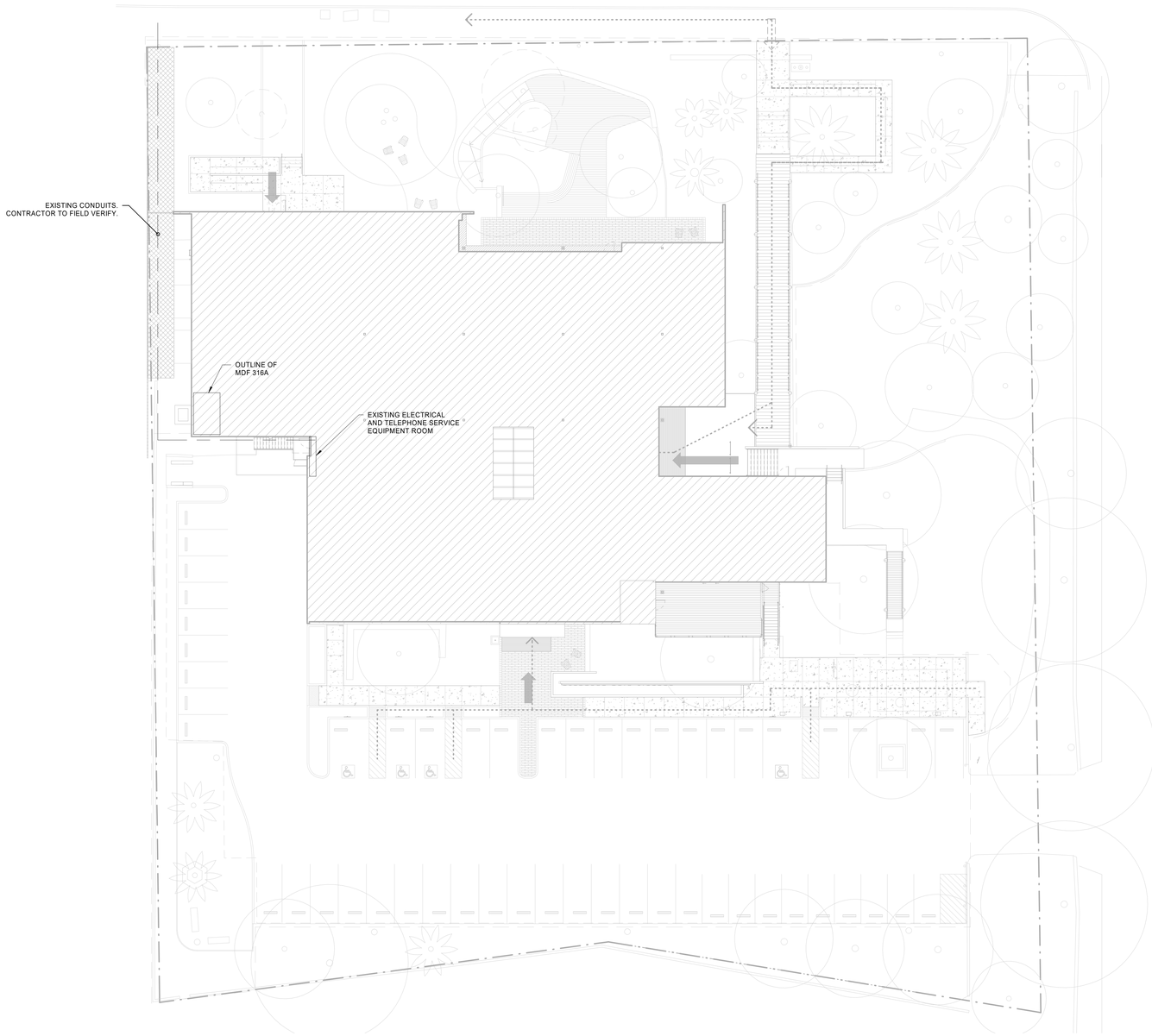
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T002

8/13/2025 10:23:04 AM

NOTES (THIS SHEET ONLY):

1. TWO 2" UNDERGROUND CONDUITS. PROVIDE ONE 1.25" INNERDUCT IN EACH CONDUIT. COORDINATE ROUTING AND TERMINATION LOCATIONS WITH OWNER AND ARCHITECT.



ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

TELECOM SITE PLAN

SCALE: 1/16" = 1'-0"

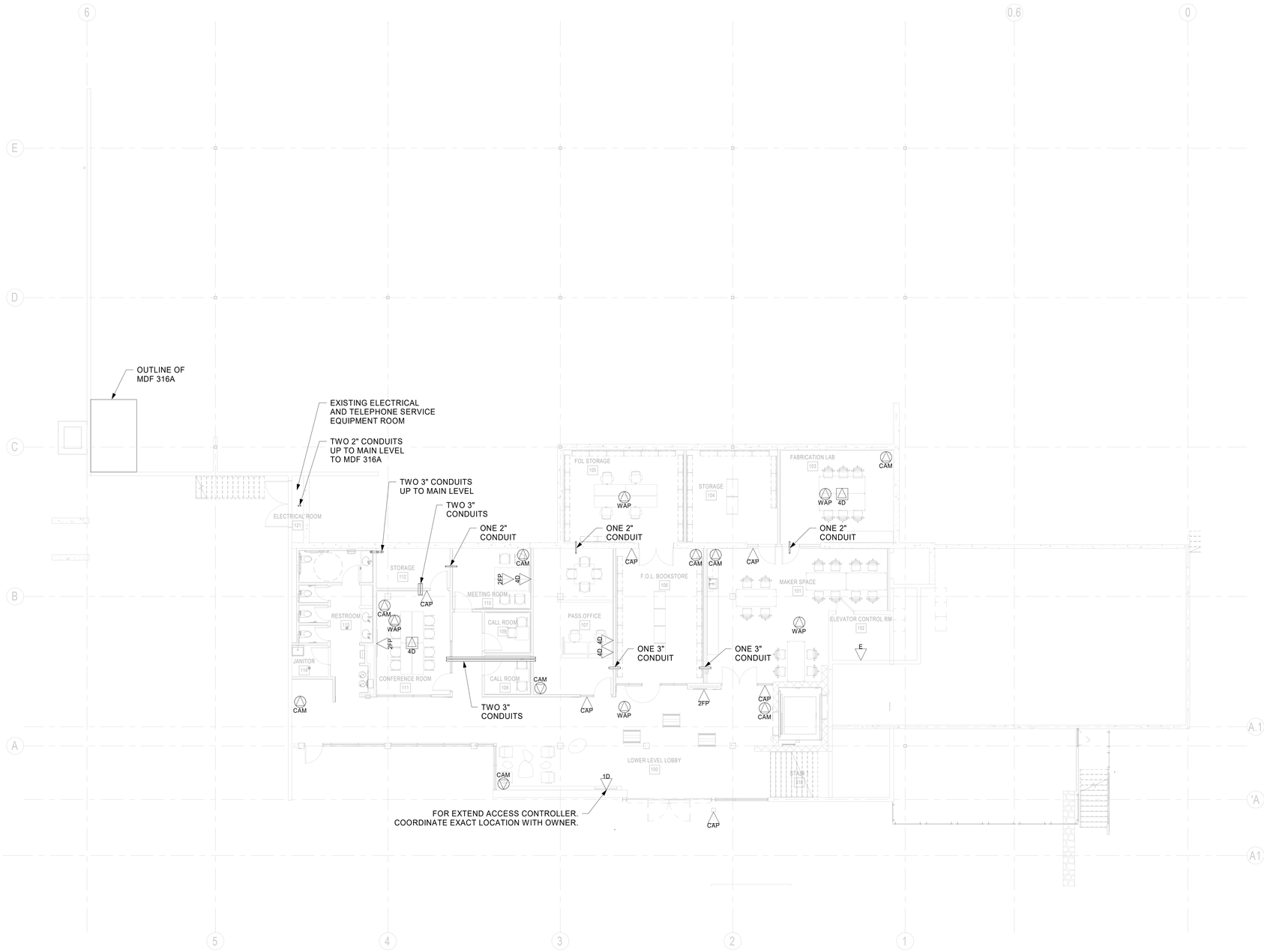
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T100

8/13/2025 10:23:06 AM

GENERAL NOTES (THIS SHEET ONLY):

A. ALL OUTLETS IN THIS AREA ARE SERVED FROM MDF 316A. TERMINATE ALL CABLES IN MDF 316A.



ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

TELECOM LOWER LEVEL FLOOR PLAN

SCALE: 1/8" = 1'-0"

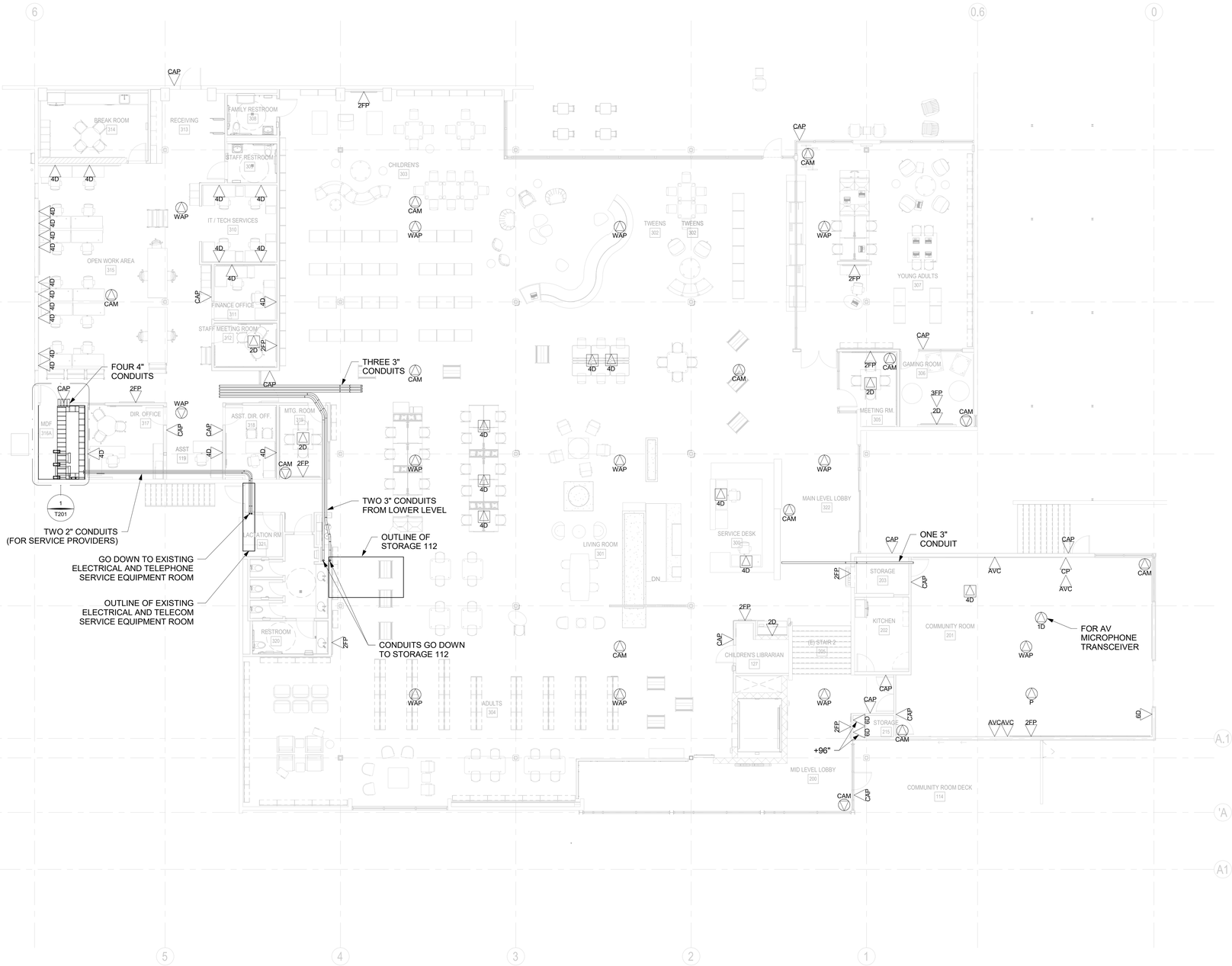
All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T101

8/13/2025 10:23:07 AM

GENERAL NOTES (THIS SHEET ONLY):

A. ALL OUTLETS IN THIS AREA ARE SERVED FROM MDF 316A. TERMINATE ALL CABLES IN MDF 316A.



ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.286.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08/15/2025

SHEET TITLE:

TELECOM MAIN LEVEL FLOOR PLAN

SCALE: 1/8" = 1'-0"

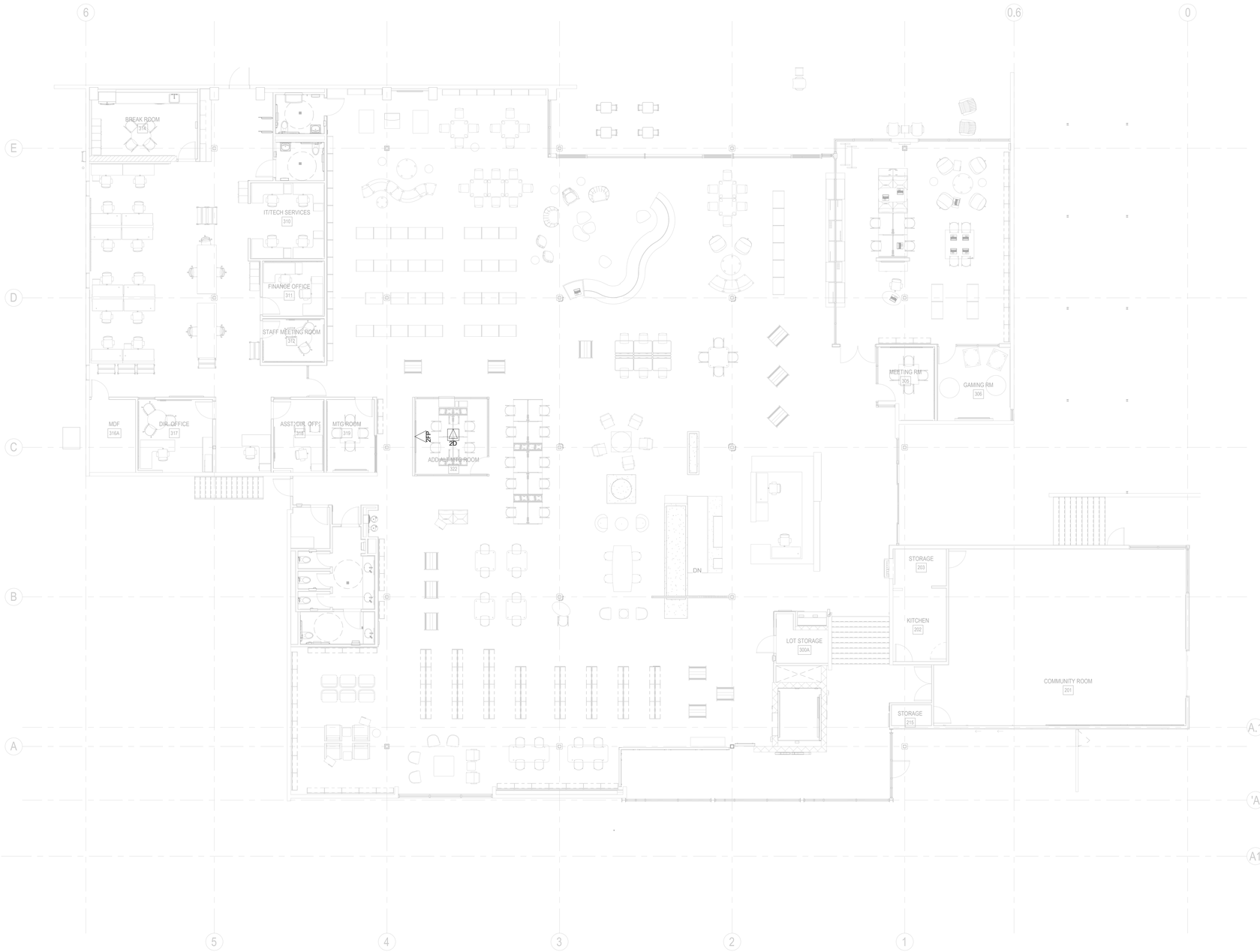
All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T102

8/14/2025 10:37:00 AM

GENERAL NOTES (THIS SHEET ONLY):

A. ALL OUTLETS IN THIS AREA ARE SERVED FROM MDF 316A. TERMINATE ALL CABLES IN MDF 316A.



ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

SHEET TITLE:

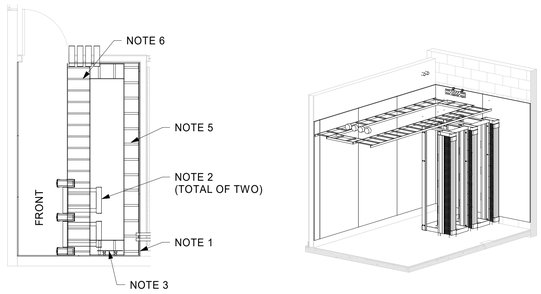
TELECOM MAIN LEVEL FLOOR PLAN - ADD ALTS

SCALE: 1/8" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T102A

8/14/2025 10:37:01 AM



1 MAIN LEVEL MDF 316A
1/4" = 1'-0"

SHEET NOTES (THIS SHEET ONLY)

1. 4'W x 8'H x 0.75"D A-C GRADE FIRE RETARDANT TREATED PLYWOOD BACKBOARD. BACKBOARD SHALL BE PAINTED WITH TWO COATS OF FIRE RETARDANT PAINT PRIOR TO INSTALLATION (ALL WALLS).
2. 4-POST TELECOMMUNICATION EQUIPMENT RACK.
3. TELECOMMUNICATION MAIN GROUNDING BUSBAR. MOUNTED AT 96" AFF.
4. TELECOMMUNICATION GROUNDING BUSBAR. MOUNTED AT 96" AFF.
5. 12" LADDER CABLE RUNWAY.
6. 18" LADDER CABLE RUNWAY.

GENERAL NOTES (THIS SHEET ONLY)

A. SEE TELECOMMUNICATION FLOOR PLANS FOR CONDUITS, CONDUIT CORES, AND CONDUIT SLEEVES ENTERING THE MDF AND IDF ROOMS.

B. CABLE RUNWAY: PROVIDE ALL PARTS AND PIECES TO CREATE A CONTINUOUS PATHWAY FOR CABLES WITHIN MDF AND IDF ROOMS. PROVIDE PARTS TO SUPPORT CABLE CONTINUOUSLY FROM THE CONDUITS, CONDUIT CORES, AND CONDUIT SLEEVES ENTERING THE MDF AND IDF ROOMS TO THE EQUIPMENT RACKS AND BACKBOARDS.

C. INSTALL WITH A MINIMUM OF 36" CLEAR ACCESS BEHIND AND IN FRONT OF RACK UNLESS OTHERWISE DIRECTED BY DRAWINGS.

D. MINIMUM CLEARANCE BETWEEN END OF ROW AND WALL SHOULD BE 36".

ANDERSON BRULÉ ARCHITECTS
325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com
409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO
waveguide

STAMP
REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010
DATE: 08/15/2025
SHEET TITLE:

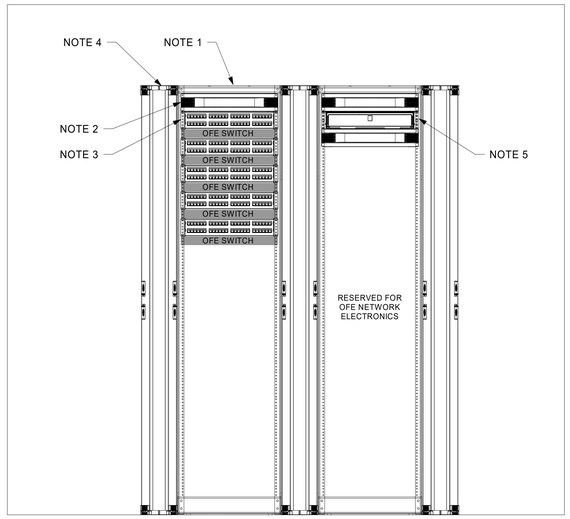
TELECOM ENLARGED PLANS

SCALE: 1/4" = 1'-0"

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T201

8/13/2025 10:23:11 AM



1 MAIN LEVEL MDF 316A RACK ELEVATION

NTS

SHEET NOTES (THIS SHEET ONLY)

1. 4-POST TELECOMMUNICATION EQUIPMENT RACK.
2. 2RU HORIZONTAL CABLE MANAGEMENT.
3. 2RU 48-PORT ANGLED PATCH PANEL.
4. 6" DOUBLE SIDED VERTICAL CABLE MANAGEMENT.
5. FIBER OPTIC PATCH PANEL.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

CONSULTANTS LOGO

waveguide

STAMP

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
Hung T Le
BICSI ID # 162961
EXPIRES 12-31-27
RCDD

NO.	DATE	REVISIONS
	10/11/2023	100% DESIGN DEVELOPMENT
	03/28/2024	50% CONSTRUCTION DOCUMENT
	04/19/2024	75% CONSTRUCTION DOCUMENT
	06/17/2024	90% CONSTRUCTION DOCUMENT
	08/15/2025	ISSUE FOR BID

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO. 2111010

DATE: 08/15/2025

SHEET TITLE:

TELECOM RACK ELEVATIONS

SCALE: As indicated

All drawings and written material appearing herein constitute original and unpublished work of the Anderson-Brulé Architects and may not be duplicated without the written consent of Anderson-Brulé Architects. ©

T301

8/13/2025 10:23:11 AM